A+

Apple II/Macintosh

THE INDEPENDENT GUIDE TO APPLE COMPUTING

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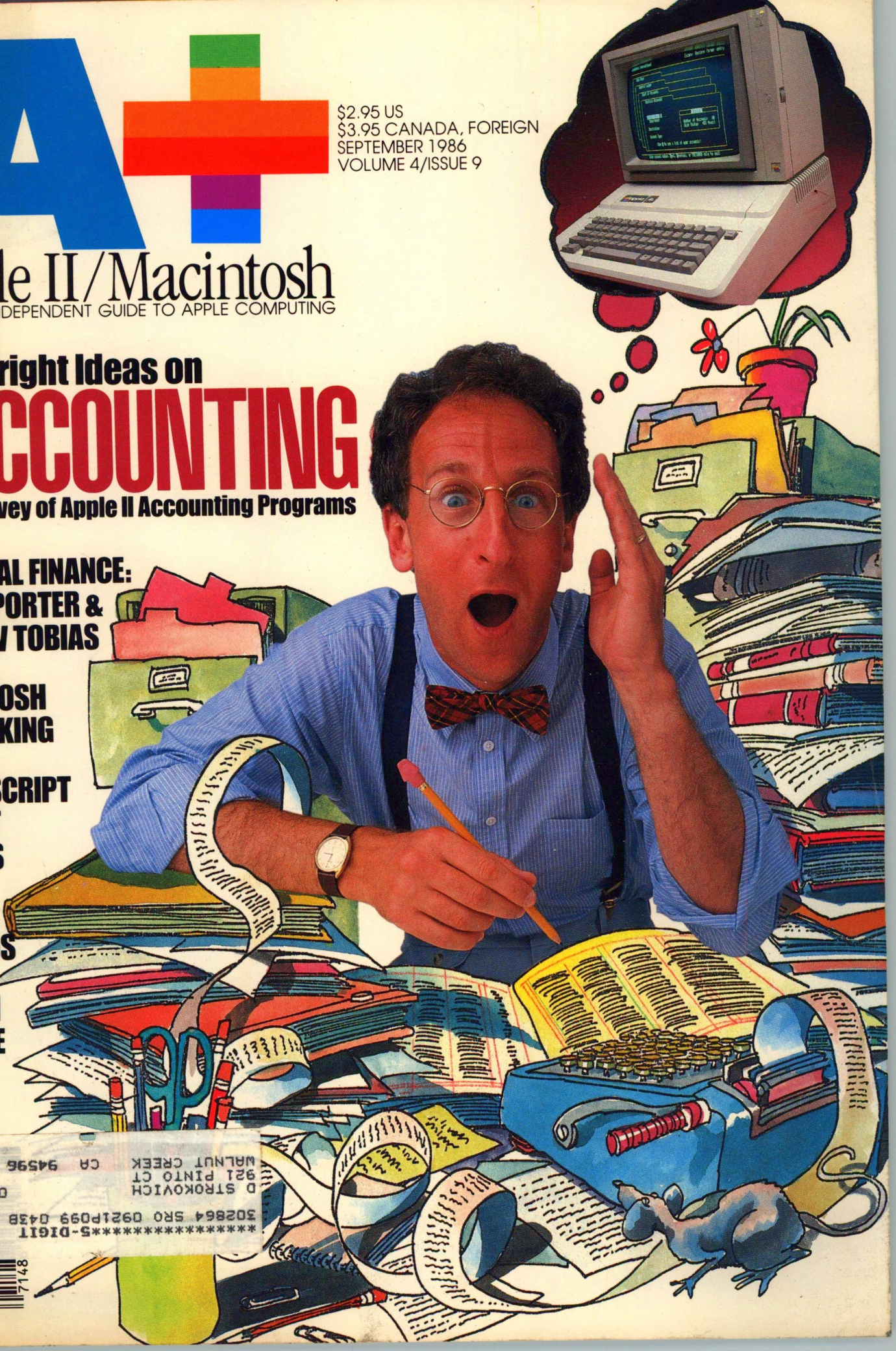
SEPTEMBER 1986
VOLUME 4/ISSUE 9



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7 POSTSCRIPT OUTPUT DEVICES

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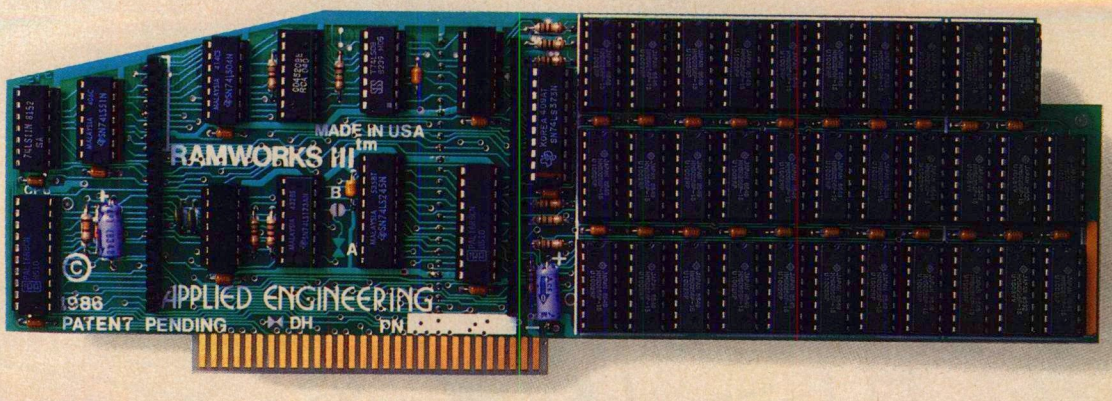


With battery backed RAM port, RGB port, increased memory capacity, full software compatibility and more compact design, RamWorks III is a generation ahead.

RamWorks III is the newest 3rd generation RAM card for the Apple IIe. It incorporates all of the technology and improvements that years of experience and over a hundred thousand sales have given us. By selling more memory cards than anyone else and listening to our customers, we were able to design a memory card that has the ultimate in performance, quality, compatibility and ease of use. We call it RamWorks III, you'll call it awesome!

The AppleWorks Amplifier.

While RamWorks III is recognized by all memory intensive programs, NO other expansion card comes close to offering the multitude of enhancements to AppleWorks that RamWorks III does. Naturally, you'd expect RamWorks III to expand the available desktop, after all Applied Engineering was a year ahead of everyone else *including Apple* in offering more than 55K, and we still provide the largest AppleWorks desktops available. But a larger desktop is just part of the story. Look at all the AppleWorks enhancements that even Apple's own card does not provide and *only* RamWorks III does. With a 256K or larger RamWorks III, *all* of AppleWorks (including printer routines) will automatically load itself into RAM dramatically increasing speed by eliminating the time required to access the program disk drive. Switch from word processing to spreadsheet to database at the speed of light with no wear on disk drives.

Only RamWorks eliminates AppleWorks' internal memory limits, increasing the maximum number of records available from 1,350 to over 25,000. *Only* RamWorks increases the number of lines permitted in the word processing mode from 2,250 to over 15,000. And *only* RamWorks (256K or larger) offers a built-in printer buffer, so you won't have to wait for your printer to stop before returning to AppleWorks. RamWorks even expands the clipboard. And auto segments large files so they can be saved on two or more disks. You can even have Pinpoint, MacroWorks or Jeeves and your favorite spelling checker in RAM for instant response.

RamWorks, nothing comes close to enhancing AppleWorks so much.

The Most Friendly, Most Compatible Card Available.

Using RamWorks III couldn't be easier because it's compatible with more off-the-shelf software than any other RAM card. Popular programs like AppleWorks, Pinpoint, Catalyst, MouseDesk, Howard-Soft, FlashCalc, The Spread Sheet, Managing Your Money, SuperCalc 3a, and MagiCalc to name a few (and *all* hardware add on's like ProFile and Sider hard disks). RamWorks is even compatible with software written for Apple cards. But unlike other cards, RamWorks plugs into the IIe auxilliary slot providing our super sharp 80 column text in a completely integrated system while leaving expansion slots 1 through 7 available for other peripheral cards.

RamWorks III is compatible with all Apple IIe's, enhanced, unenhanced, American or European versions.

Highest Memory Expansion.

Applied Engineering has always offered the largest memory for the IIe and RamWorks III continues that tradition by expanding to 1 full MEG on the main card using standard RAMs, more than most will ever need (1 meg is about 500 pages of text)...but if you do ever need more than 1 MEG, RamWorks III has the widest selection of expander cards available. Additional 512K, 2 MEG, or 16 MEG cards just snap directly onto RamWorks III by plugging into the industry's only low profile (no slot 1 interference) fully decoded memory expansion connector. You can also choose non-volatile, power independent expanders allowing permanent storage for up to 20 years.

It Even Corrects Mistakes.

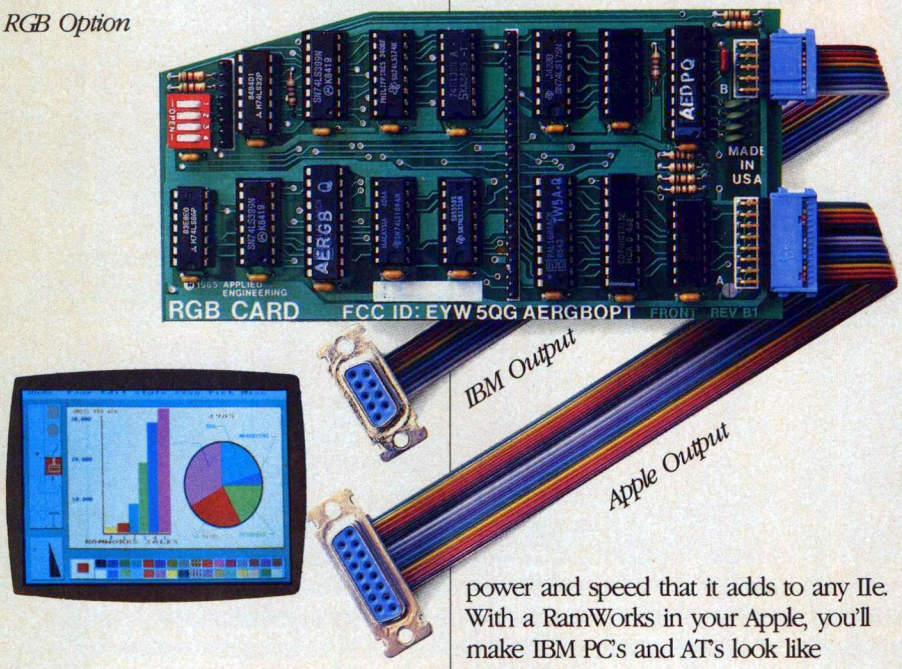
If you've got some other RAM card that's not being recognized by your programs, and you want RamWorks III, you're in luck. Because all you have to do is plug the memory chips from your current card into the expansion sockets on RamWorks to recapture most of your investment!

The Ultimate in RGB Color.

RGB color is an option on RamWorks and with good reason. Some others combine RGB color output with their memory cards, but that's unfair for those who don't need RGB *and* for those that do. Because if you don't need RGB

Applied Engineering doesn't make you buy it, but if you want RGB output you're in for a nice surprise because the RamWorks RGB option offers better color graphics plus a more readable 80 column text (that blows away any composite color monitor). For only $129 it can be added to RamWorks giving you a razor sharp, vivid brilliance that most claim is the best they have ever seen. You'll also appreciate the multiple text colors (others only have green) that come standard. But the RamWorks RGB option is more than just the ultimate in color output because unlike others, it's fully compatible with all the Apple standards for RGB output control, making it more compatible with off-the-shelf software. With its FCC certified design, you can use almost any RGB monitor because only the new RamWorks RGB option provides both Apple standard and IBM standard RGB outputs (cables included). The RGB option plugs into the back of RamWorks with no slot 1 interference and remember you can order the RGB option with your RamWorks or add it on at a later date.

RGB Option



True 65C816 Bit Power.

RamWorks III has a built-in 65C816 CPU port for direct connection to our optional 65C816 card. The only one capable of linearly addressing more than 1 meg of memory for power applications like running the Lotus 1-2-3™ compatible program, VIP Professional. Our 65C816 card does not use another slot but replaces the 65C02 yet maintains full 8 bit compatibility.

Endorsed by the Experts.

A+ magazine said "Applied Engineering's RamWorks is a boon to those who must use large files with AppleWorks...I like the product so much that I am buying one for my own system." inCider magazine said "RamWorks is the most powerful auxiliary slot memory card available for your IIe, and I rate it four stars...For my money, Applied Engineering's RamWorks is king of the hill."

"I wanted a memory card for my Apple that was fast, easy to use, and very compatible; so I bought RamWorks."

Steve Wozniak, the creator of Apple Computer

Apple experts everywhere are impressed by RamWorks's expandability, versatility, ease of use, and the sheer power and speed that it adds to any IIe. With a RamWorks in your Apple, you'll make IBM PC's and AT's look like slowpokes.

Quality and Support of the Industry Leader

RamWorks III is from Applied Engineering, the largest, most well supported manufacturer of Apple peripherals and the inventor of large RAM cards for the Apple. With our 5 year no hassle warranty and outstanding technical support, you're assured of the most trouble free product you can buy.

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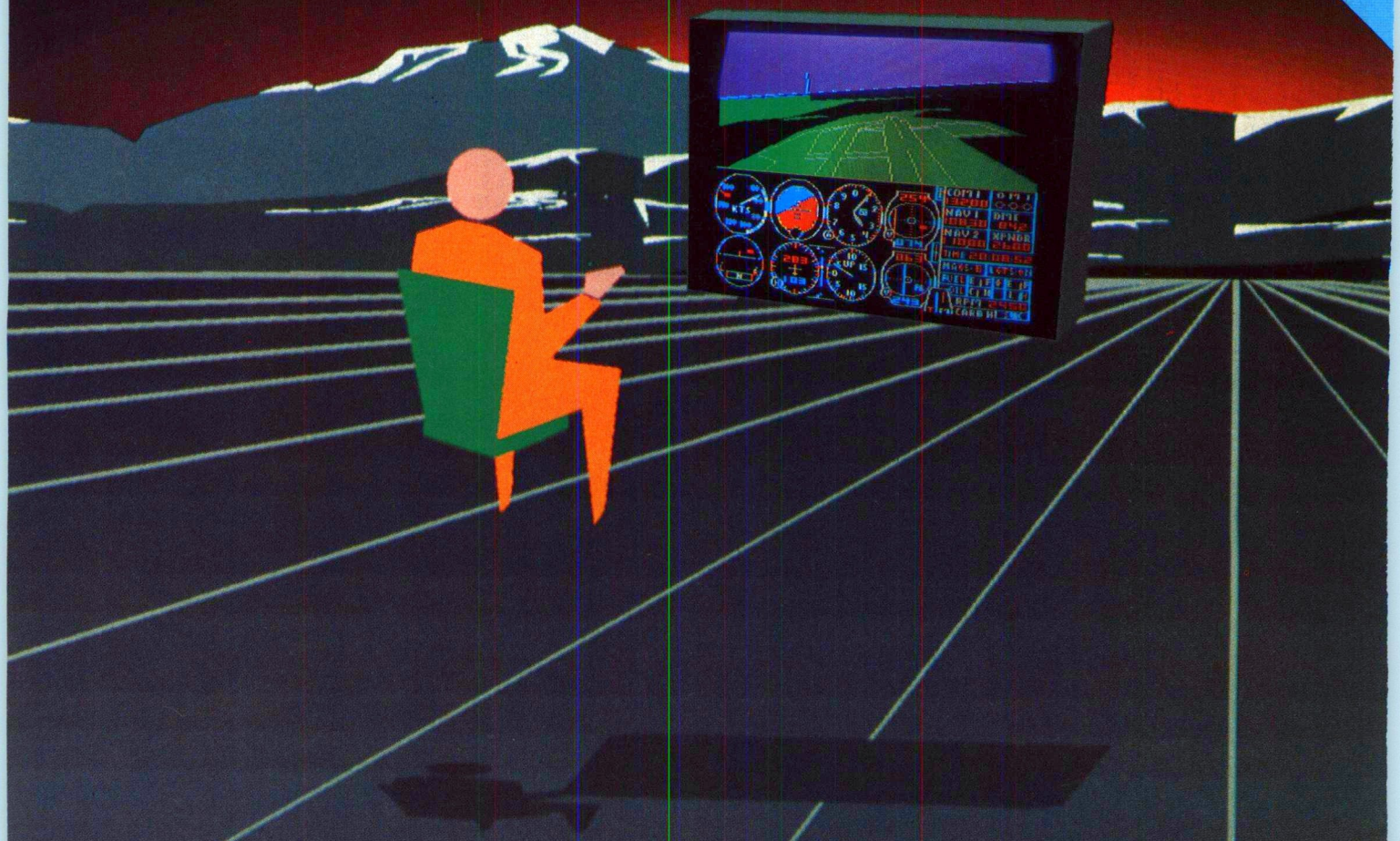
For Apple II, Apple II+, & Apple IIe



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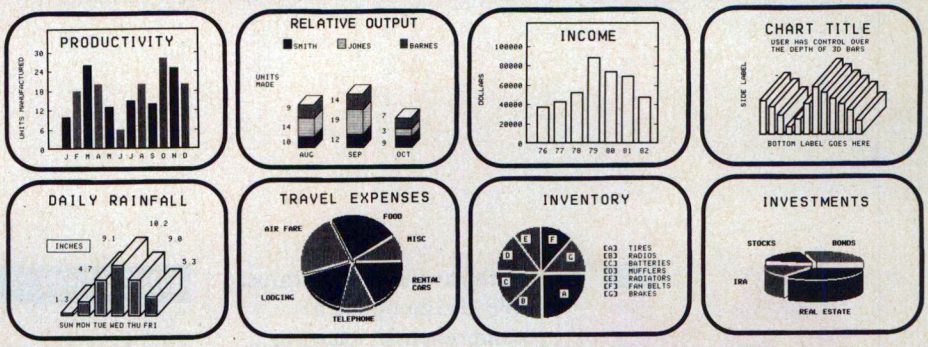

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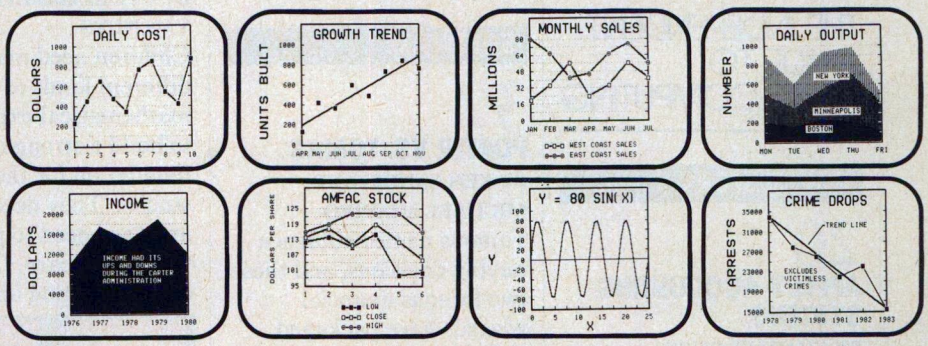

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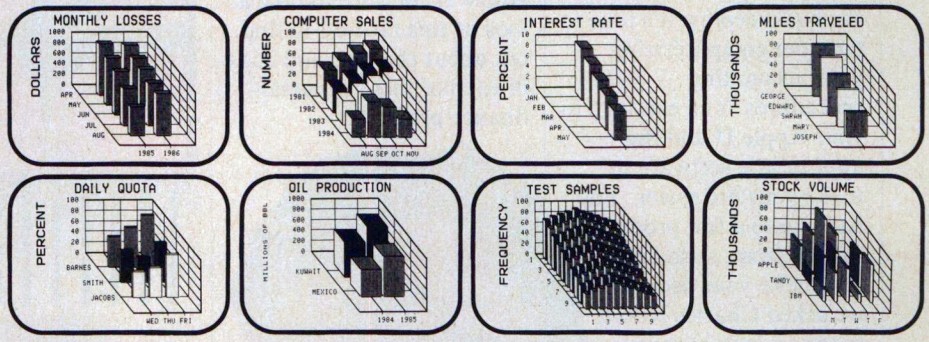

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Children need many different kinds of mathematical experiences to build a strong conceptual foundation for their future studies. They need to learn, and they need to practice what they learn. Computers can be exciting and useful tools for providing some of those early experiences. In this article, our author reviews eight programs including Stickybear Numbers, Learning with Leeper, Getting Ready to Read and Add, Counting Parade, Early Games for Young Children, Charlie Brown's 1,2,3's, Let's Go Fishing, and Microaddition/Microsubtraction.

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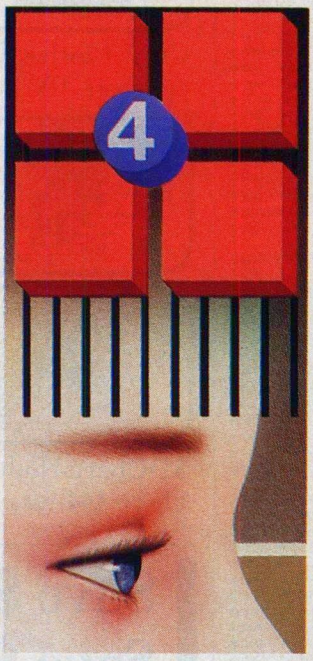
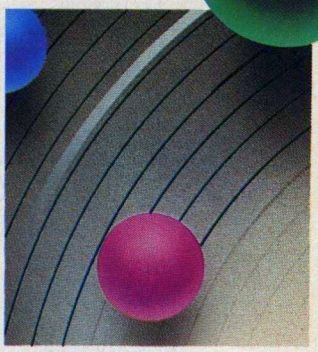
You've probably seen the advertisements for a new scanner technology from Cauzin Systems called Softstrips. To keep you up to date on technological developments, we asked our authors to take a look at this new product, which is available in both Apple II and Mac versions.





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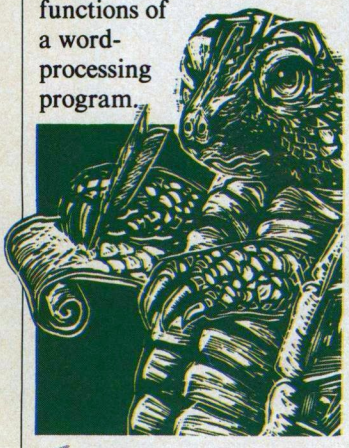

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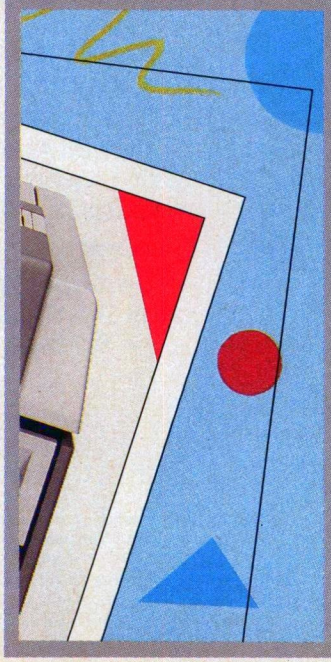
The Apple LaserWriter isn't the only high-performance output device you can use with a Macintosh. Because the Mac speaks the device-independent PostScript page-description language, you can connect it to any PostScript-capable output device. This article covers several such devices, including the LaserWriter and LaserWriter Plus, QMS PS 800 and PS 2400, Dataproducts LZR-2665, and the Linotronic 100P and 300P.



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BY CRAIG L. WEBB
Maps have long been valued for the way they show instantly where a place is and how it relates to the surrounding world. Until recently there was no easy way to put a map into a report or term paper. The Macintosh has ended that dilemma. With it, you can create all the maps you want, modifying them to meet your particular needs.

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SPEAKING OF GRAPHICS
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A Strange Woman Wants to Marry You.

An unknown man is trying to kill you. The State of Texas wants you for murder. But that's not your problem. Your real problem is...

AMNESIA

It's a new text adventure that feels like a Hitchcock-style nightmare. You're lost on the streets of Manhattan with no money, no friends, no memory—and someone wants you dead. Somewhere in The City are the clues to your identity—and your survival. The hard part is finding them—and eliminating your problems before they eliminate you.

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>
> —Ask the guard for some food, thank him, then eat it and go to sleep.

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> It feels great to be a faceless, nameless atom among a million others churning about in the grid of Manhattan's streets. It feels safe. As you approach Fifth Avenue, the brief buoyancy of feeling free gives way to ordinary now-what anxieties. You've got no money, no credit cards, nowhere to sleep, and no visible means of support.
>
> —Beg for money, then enter the subway station.

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CIRCLE 168 ON READER SERVICE CARD

Message from Maggie

AN EDITOR ABROAD

Once in a while we are the recipients of a pleasant relief from the quotidian, usually in the form of travel and, in my case, most preferably Europe. I was treated to just such a trip recently when I was invited to speak in Edinburgh, Scotland, at a day-long marketing seminar for artificial-intelligence developers. My assignment was to show foreign developers how to tap the American press to enhance their software-marketing efforts. After my speech, I flew to Paris to check out Europe's largest Apple market. During my little sojourn, I discovered that the European marketplace for Apples is as diverse as the American one is.

The Apple IIe and IIc are quite popular in the British Isles, according to one of the companies I visited, Cirtech. Cirtech is a family-owned and -run business located in the lush Scottish countryside in a small town called Galashiels, about a half an hour's drive from Edinburgh. It manufactures add-on boards for Apple II-series computers. You may have noticed some of its products, such as Flipster, advertised in the pages of *A+*. The Robertsons, who own Cirtech, and their staff reminded me so much of developers during the early days of Apple—small shop, abundant brains, and high enthusiasm.

Numerous other high-tech companies are nestled in and around Edinburgh, which is considered one of the (if not *the*, depending on whom you are talking to) leading technical brain trusts of Europe because of the prestigious Edinburgh University. Nicknamed Silicon Glen after the famous Silicon Valley, this region has attracted big-name companies such as IBM, Hewlett-Packard, and Burroughs. Even more important is that the Edinburgh area is a hotbed of innovation and new-product development, especially in the artificial-intelligence field. The Scottish Development Agency, which put on the conference at which I spoke, is largely responsible for engineering the growth of the electronics industry in Scotland. It provides multifaceted assistance to the industry, from convincing established companies to build manufacturing facilities to putting on seminars to help fledgling software companies learn how to market their products in the U.S.

While the Apple II is popular in the British Isles, the Macintosh has won the hearts of the French. The Macintosh was marketed quite differently in France than it was in the U.S., and the tactics worked well for the head of Apple France, Jean-Louis Gassée. According to the folks at Apple France, they used snob appeal as a marketing ploy, which worked effectively on the French. As a result, the Mac got off to a strong start and continues to sell well. Monsieur Gassée's success with the Mac ultimately landed him a plum job at Apple in the U.S.

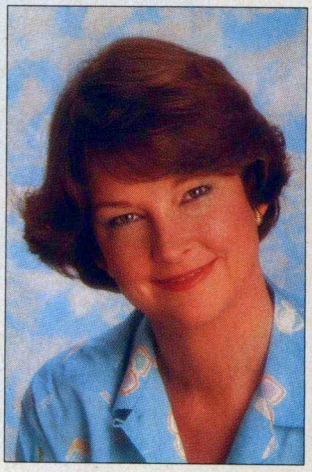
Apple France is much like Apple Cupertino, only smaller—a maze of cubicles, people moving at a slow run and working late, extreme *esprit de corps*. Apple France's headquarters are situated in a small industrial community, Les Ulis, located on the outskirts of Paris.

Developers for the Mac are abundant in France. At one point, there were 1500, and that number has since been whittled down to a mere 350 certified developers! Although I met with only a few of them, I gathered that they are a talented and lively bunch. From what I saw of products from companies such as Marylène Delbourg Delphis' ACI, you can expect to see some fantastic products coming from these folks.

Enjoy the rest of your summer—and get ready for a momentous September. +

Maggie Canon

MAGGIE CANON/**EDITOR IN CHIEF**



The Edinburgh area is a hotbed of innovation and new-product development, especially in the artificial-intelligence field.

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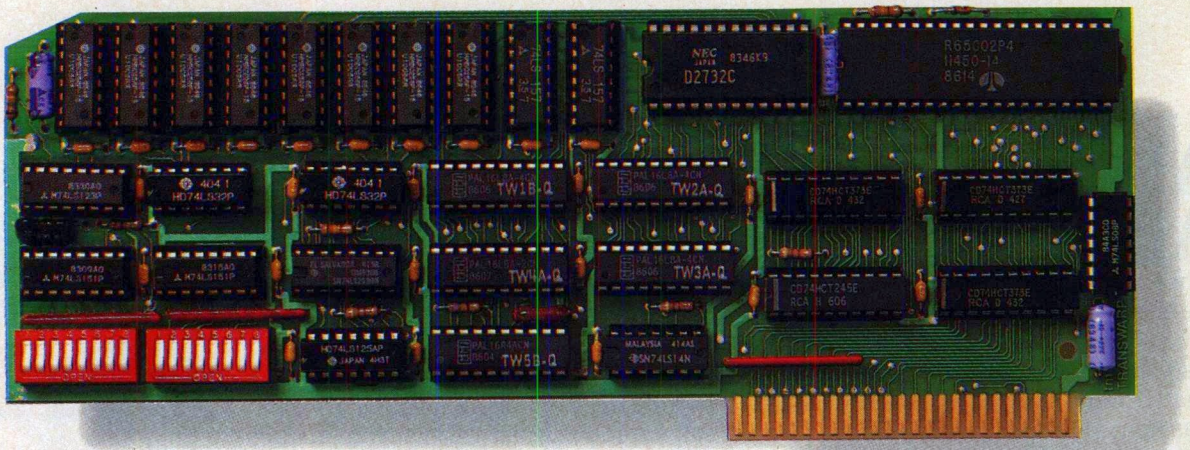

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We invite your comments.

Letters

CIVIL DISOBEDIENCE?

Dear A+: I was so pleased to read John Reimer's response (June 1986) to David Thornburg's "What's Turning Teachers into Thieves?" (March 1986). Mr. Reimer did a wonderful job of speaking for all computer-using educators when he articulated the difficulties of obtaining a usable number of copies of decent-quality software for use with students in schools, where budgets are always tight and supplies scarce.

What I appreciated even more than his picture of the nitty-gritty problem was Mr. Reimer's identification of the company that he believes the software-copying issue keeps. Surely Gandhi; Martin Luther King, Jr.; Thoreau; Emerson; and Jesus Christ would empathize with the moral imperative for teachers to be civilly disobedient of the copyright law and toward the capitalistic software publishers.

But what a nice twist to this concept of passive resistance we teachers enjoy. While flying in the face of the opportunist authors and publishers of computer programs by making illegal copies and, thus, reducing their deserved profits to a fraction of what they would have been, we also get to use the software! It's so rare in life that you can take a moral stand and still get what you wanted in the first place.

One facet of the civil disobedience concept doesn't ring quite true here, though. Being truly passively resistant requires that *no one* or *nothing else be harmed*, and it would seem that, unless the economics of the software business are radically different from those of any other, damage is being done to the publishers in more than one way.

When I don't buy a software package because I think it's overpriced, I'm passing up the ground round; I'm leaving the designer wear on the rack and the sportscar on the lot. When I illegally copy the software, the meat is under my raincoat, the jeans are in my purse, and I drive off in the Porsche. Get it, John?

But we do have choices! We don't have to buy that software; let it sit right on the stockroom shelves. Boycott—that's what civil disobedience means. And if you really want a program that will do what the one on the shelf will, you can always take a few courses and learn to write the thing yourself! Whatever other alternative you choose, if you really want to, you *can* avoid choosing to steal.

Your letter demeans us computer-using-non-softlifting teachers, however few or many of us there may be.

It demeans those in our past who were honestly pacifist in their response to social issues with which they could not live—they were not stealing the work of another person at the same time they dissented.

And, most sadly of all, it demeans your students. What do they learn from your example that they haven't already learned in the street?

I don't have all the answers. I know that there are lots of things I could be doing with students that don't get done because the budget issue creates one limitation—but it has always done that. Teachers never have enough of what they need to do their jobs the way they know they could—that's teaching and that's life.

Have you ever wondered why software publishers started offering lab packs? Certainly not because we bought one Apple Writer and booted it into ten machines to teach word processing! Why do districts pay thousands of dollars to join MECC? And why do school boards have policies that state that any teacher found in violation of copyright law is on his/her own in court?

Your letter was a real dissappointment. We may both be teachers, John, but we aren't in the same profession. I don't steal software in or out of school, and I teach my kids and my teachers the copyright law.

Wendy A. Sprout
Computer Lab Coordinator
Marshall-Walker High School
Richmond, VA

LET'S STOP CLONING AROUND

Dear A+: Although Charles Rubin's article and review of the two Apple clones, the Ace 2000 and the Laser 128, which appeared in the June 1986 issue of *A+* was relatively complete regarding the reviews of these two products, his background material on Franklin, the company, was neither accurate nor fair.

It is true that the filing of Chapter 11 under the backruptcy code by Franklin was a direct result of a copyright-violation lawsuit initiated by Apple Computer, but it is untrue to make the statement that Franklin "lost a 1984 court decision" made upon this lawsuit.

The courts never found Franklin guilty of copyright infringement. In fact, the first time the case came to court, Franklin actually received a not-guilty decision. Then Apple filed an appeal to a higher court of law. This higher court made a no-win/lose decision. The higher court simply stated, "While we are not overturning the original judgment, we do

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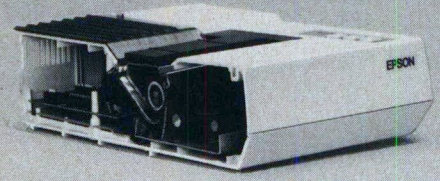

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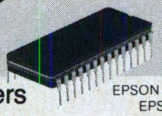

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CIRCLE 146 ON READER SERVICE CARD

feel that those who gave the first judgment should re-think this matter over, once again."

Franklin did conclude a settlement with Apple—because the company was suffering financially from the court battle—that included a $2.5 million payment (based on $25 multiplied by the approximately 100,000 Franklins that had been sold) and an agreement that Franklin would discontinue the use of the ROMS in question and that Apple would maintain the right to inspect any new machine Franklin brought out (for possible copyright infringement).

To default in such a battle (via an out-of-court settlement) does not and should not insinuate that any wrongdoing actually occurred. To those who've said, "Even if Franklin had not settled out of court but had rather continued to fight, they would have lost," I simply state that Franklin did have some legitimate arguments and that possibly, just possibly, with a good enough set of legal counselors, it might have won the overall battle.

Tom Ezell
Microcomputer Consultant
New Orleans, LA

WELCOME III ATTENTION

Dear *A+*: I am one of those fiercely loyal Apple III owners your "Apple III Alter Ego" article mentioned in the July issue.

I dropped most of my other computer magazine subscriptions a couple of years ago when they dropped their Apple III coverage. Your publication seems to be the exception and truly does cover the entire Apple line. Quite often your "Pipeline" section makes mention of III compatibility with a product (although I wish more manufacturers would see if their product was III-compatible). Also, you have made mention of or run an article on the Apple III in almost every other issue. Many magazines have ignored the mere 80,000 IIIs in existence, and we III owners ignore them in return.

What this letter boils down to is this; I own eight Apple IIIs, with plans to add another five by the year's end. I am elated that your publication has chosen not to ignore us, and I will continue to support you in the hope that you will continue to support the Apple III. My III and I bid you 512,000 thank-yous.

Michael R. Schroeder
New Brighton, NM

GONE, BUT NOT FORGOTTEN

Dear *A+*: Last winter I wrote a letter complaining of the lack of Apple III coverage by *A+*. I expressed a concern that *A+* would go the way of other Apple publications by taking the III out of the Apple vocabulary.

I received a note back informing me not to worry, that *A+* would not ignore the 100,000 or so Apple III users. Talk is cheap, and, frankly, I had my doubts.

The doubts are no longer there. You have covered the III several times in past issues. Most recently, you mentioned the III in the cable-connection article in the June issue. The July issue had an excellent article by Chris Albertson entitled "Apple II Alter Ego." Thank you!

Now if only you could get the software manufacturers to tell you when the software that you listed in "Pipeline" worked in emulation . . . and if only you could run an article on ProDOS and SOS compatibility . . . and if only . . .

Jeffrey Neil Fritz
Williamson, WV

MAIL-ORDER SUCCESS

Dear *A+*: This is to say a good word for the courtesy, service, and helpfulness of Computer Network (Friendly Computer) of Carlsbad, New Mexico, in a mail-order situation.

I ordered and received a MultiRam 512K card for my Apple IIc but was not successful in installing the card myself on a rainy Saturday and in fact broke a pin in my repeated attempts.

In despair, I phoned the company, which, to my pleasant surprise, volunteered to fix it if I sent the IIc. I did so that same afternoon. The repair was done promptly, and the charge of $30 plus shipping was very reasonable. The computer is now back to full usefulness and shows a delightful "425K available" for AppleWorks.

My faith in mail order has always been pretty high, but this experience was several notches beyond anything before. I thank Computer Network for the help and *A+* for being the source of the ads.

W. Henry Linton, Jr.
Wilmington, DE

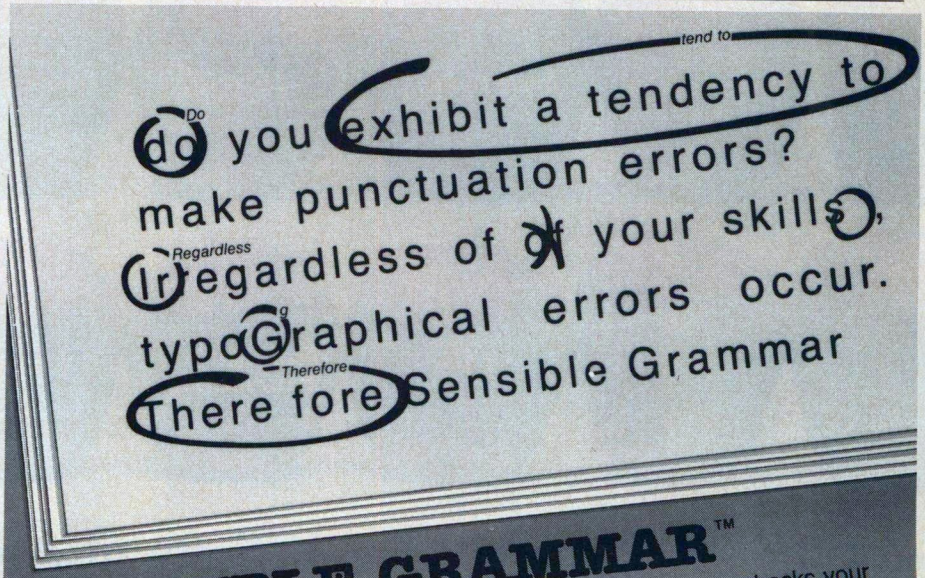
BELIEF IN COMPATIBILITY

Dear *A+*: In reading your June 1986 issue, I was very surprised to see some comments made by Dan Pote, president of Applied Engineering.

In your article "Send in the Clones," Mr. Pote was quoted as saying, "The word *compatible* is a meaningless word nowadays" and "I don't think compatibles offer much." This type of comment from the president of Applied Engineering, which is very outspoken on the compatibility of its products in its advertising, was quite surprising. I can not imagine Mr. Pote really believing what he was saying. Witness the fact that in the ad for Applied Engineering's RamWorks II in the same issue, the word *compatibility* was used 12 times.

I feel that the general use of the word *compatibility* has had so many definitions applied to it that it has all but lost any meaning without a full set of qualifications, which has become a large stumbling block for many Apple users. I know I have used "compatible" hardware and software, but going from one program to another or from one piece of hardware to another has caused major reconfiguration problems.

Bruce Lewis
Alabaster, AL



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Sensible Grammar ($99.95) which works on Apple 128K //e and //c, and **Sensible Speller** ProDOS ($125), which works on Apple //c, //e and II+, are available on 5" and 3.5" disks. **Sensible Speller IV** ($125) works with Apple //e, //c, II+, II and Apple-compatible computers. **Sensible Technical, Stedman's Medical** and **Black's Law** Dictionaries are available on 5" disk for $39.95 each. All programs are available separately.

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†Note: CP/M, Pascal and PFS:Write-DOS versions do not suggest correct spelling of words or allow immediate correction of misspellings.

CIRCLE 227 ON READER SERVICE CARD

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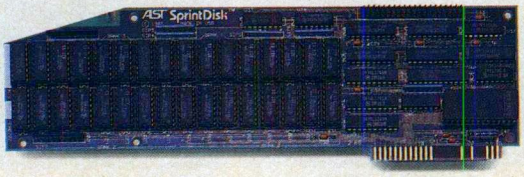

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CIRCLE 323 ON READER SERVICE CARD

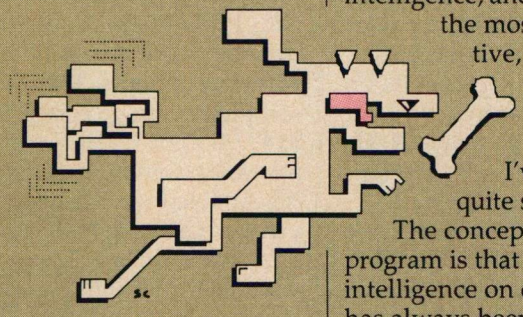
BY FREDERIC E. DAVIS

NewsPlus

It's not really fair to call Puppy Love a game, but the program is too much fun to call it anything else.

ARTIFICIAL DOG INTELLIGENCE

Now here's a program that's a real dog—uh, I mean, an artificial dog. Puppy Love is a Macintosh program that simulates artificial dog intelligence, and it's one of the most innovative, intriguing, and fun computer programs I've seen in quite some time.



The concept of the program is that artificial intelligence on computers has always been hindered by the lack of a natural-language interface that allows humans to converse with computers. The creator of the program, Tom Snyder Productions, figured that it would be easy to simulate the intelligence level of a dog, since no spoken-language factor was involved. So, armed with artificial-intelligence theories developed at MIT, the authors of the software created a superb program that creates artificial puppies for you to try your hand at training.

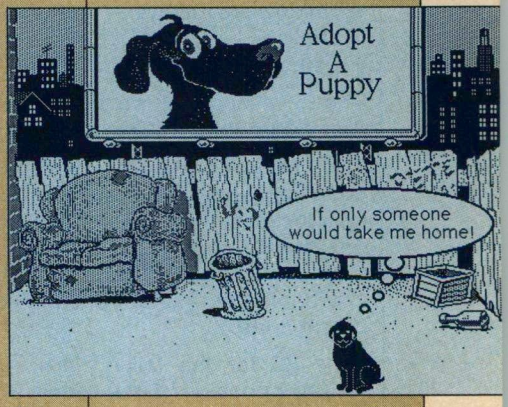
When you start the program, you receive an option of starting with a new puppy or working with one that's already been trained.

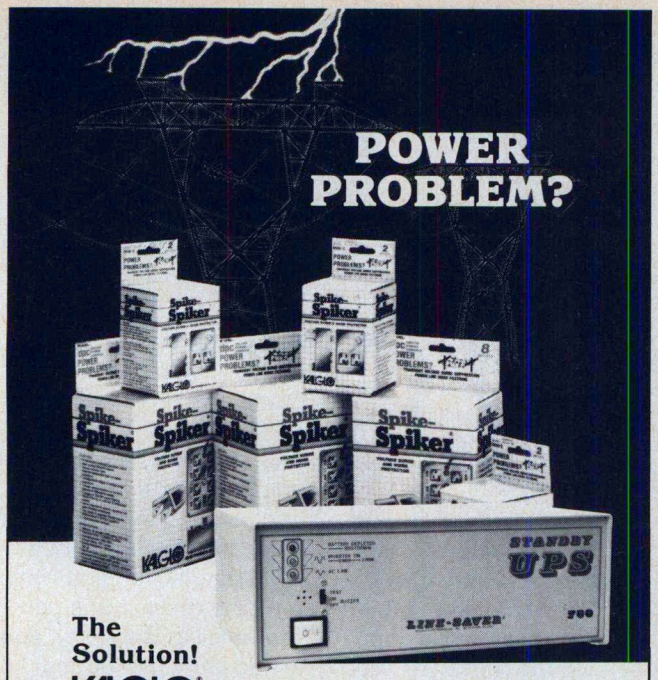
If you start with a new puppy, the program first asks you to name it and then presents you with an animated sequence that sets up the following scenario: Your puppy comes prancing onto the screen in a back alley and notices a billboard announcing a big dog show. The puppy gets dreams of grandeur and seeks your help in training for the big show. You have two main tools for training the puppy, a hand and a bone. The hand represents punishment, and the bone represents reward.

Using these two tools, you can teach your dog some absolutely amazing tricks. Once you have taught your dog a bunch of tricks, you can take it to the show to compete in events and possibly win ribbons and trophies. You can save your trained dog on disk for further training. In fact, I'm sure that well-trained Puppy Love dogs will start showing up on CompuServe and other information-utility services, as proud trainers try to show off their puppies' abilities.

The sneaky part of this very enjoyable program is that although you think you are merely training your puppy for the big show, you are actually learning computer-programming techniques. While you are teaching your puppy a new trick, you are actually creating and testing a subroutine in an artificial-intelligence language. When you combine the tricks into a performance at the show, you are actually combining subroutines to create a program. This type of computer game has a lot more redeeming qualities than video shoot-'em-ups do. In fact, it's not really fair to call Puppy Love a game at all, but the program is too much fun to call it anything else.

In a departure from business as usual, Addison-Wesley, known best as a textbook publisher, is taking an aggressive approach to selling the program. Puppy Love will be sold for $19.95 in a cute little cardboard doghouse as an impulse-buy product. At that price, the program will have to sell in huge quantities to make Addison-Wesley much money, but I think it is good enough and inexpensive enough that it just might.





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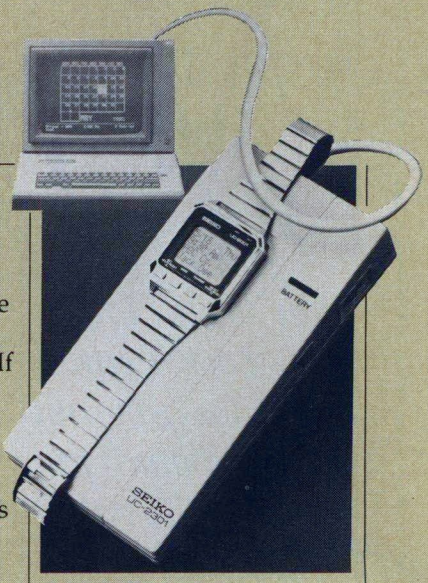
NewsPlus

WRISTTOP COMPUTING



How would you like to be able to carry a miniature computer on your wrist? If that idea appeals to you, the Seiko Datagraph 2001 is just what you need. The Datagraph 2001 is a tiny computer that contains its own microprocessor; 2K RAM; 2K ROM; a 4-line, 40-character LCD display; a battery-operated power supply; and a special 2048-bps wireless modem that you use to download data from an Apple II. The package includes the wrist computer, an Apple II time-scheduling software program called Time-Trax, and an interface unit that serves double duty as a ProDOS clock peripheral for the Apple and as a communications interface between the Apple and the wrist computer.

The Time-Trax program can schedule up to 99 events per day, and you can quickly download your appointment schedule, along with other data such as names and phone numbers, into the wrist computer via the wireless modem. The Datagraph is handy for people who have to take various medications at different times; the wrist computer can not only sound an alarm, but you can also program it to tell you exactly what medication to take at that time. The interface unit's ProDOS clock is a standard ProDOS clock peripheral that is compatible with AppleWorks. The complete package costs $189.90, carries a one-year warranty from Seiko, and is available from the developer, Creative Peripherals Unlimited, 22952 Alcade Drive #160, Laguna Hills, CA 92653; (800) 228-1135—in California call (714) 770-3334.

EGGS-PLANATION

In the Easter-egg-hunt section in my July column, I asked if anyone knew which version of the resource editor contained the various Easter eggs such as the Flipping-Pig mode. Well, Dave Hoefer of Newfane, Vermont, sent me a note with some screen dumps of the version in question. To find the Easter eggs I mentioned in July, use Resource Editor version 1.0 D11 2/28/86 or D12 3/03/86. Thanks, Dave!

Would you like to carry a miniature computer on your wrist?

APPLE TIGHTENS SECURITY

Apple Computer has always been the subject of a lot of attention and speculation by computer analysts and the media. Details of new Apple products always seem to surface a while before the products are to be announced. Too often, sales of the current product line drop off once reports start to surface about new products. To keep a tighter lid

on secret information related to new products, Apple has reportedly hired corporate-security specialist D. W. Hettman and Associates of Eugene, Oregon, to develop improved security measures.

COPY PROTECTION

While software vendors struggle to come up with the Gordian Knot of copy-protection schemes, one innovative firm has developed a way to copy-protect printouts. Nocopi, Inc., produces computer paper that can't be photocopied. Nocopi Security Papers come in both loose 8½ × 11-inch sheets and computer tractor-feed fanfold sheets and are available with several grades of security protection. At 5–13 cents a page, this paper is a bit pricey, but it's great for confidential product details, newsletters, sensitive financial data, and other information that you don't want people to photocopy. Nocopi paper is available from Nocopi Products, P.O. Box 1906, Burlingame, CA 94011; (415) 344-0852.

BATTLE OF THE MEGABYTES

Just as 500-megabyte CD-ROMs are looking like the best thing going in mass storage, hard-disk manufacturers Maxtor Corporation and Micropolis have been showing developers 382-megabyte 5¼-inch hard-disk drives with a built-in SCSI controller that will sell to OEM dealers for as low as $2000. This price means that these great big SCSI hard disks will sell to consumers for about $5000 sometime next year. Don't think that SCSI devices are only for the Macintosh Plus; several Apple II developers tell me they are hard at work building SCSI interface cards for the II series.

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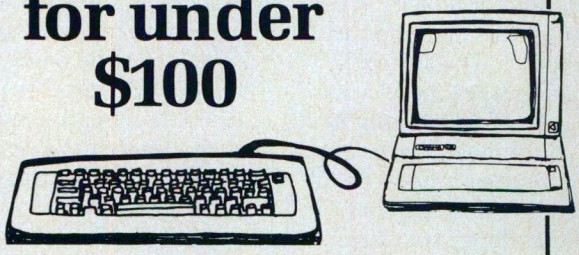

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CIRCLE 153 ON READER SERVICE CARD

NewsPlus

Apple is gearing up to adopt CD-ROM technology in a big way.

3-D VIDEO

Japanese electronics giant Sharp Corporation has developed an improved system for 3-D video that can be used for television broadcasts or computer graphics. The system's main innovation is a special set of glasses that have a shutter lens that uses high-speed liquid-crystal material to switch between transparent and opaque at a rate of about 60 times per second. You can program a computer controller or videodisc player to signal the glasses precisely when to alternate viewing between the right and left eyes so that each eye sees a separate view; the separate views are transformed into a 3-D image when the brain combines the views coming from each eye. Look for Sharp and JVC to come out with a 3-D home videodisc player that uses this technology in about six months.

WHAT'S IN A NAME?

A rose by any other name may smell as sweet, but sales may not be so sweet if a computer product doesn't have the right name. The superb object-oriented Macintosh adventure game Uninvited was originally going to be called Death Store, a name that would surely have put it on the list of programs parents wouldn't buy for their kids. Luckily, the developer realized the name was wrong in time to change it.

Living Videotext developed the landmark outline-processing program ThinkTank. The name ThinkTank is good because it is a creative moniker that serves as a reminder that the program is an organizational tool. In fact, ThinkTank has so much name awareness that now Living Videotext is thinking of changing its name to ThinkTank Corporation. So what do these guys do when they come up with the incredible next-generation outline processor? Do they call it ThinkTank Plus or ThinkTank II? No. Instead they call it More. More what?

Ideally, a product name should tell you something about the product. Good examples of names that help tell you what a product does are Apple Writer, Pinball Construction Set, and MacPaint. Names such as MITE and Jazz don't tell you a thing about a product, which means a company has to spend additional marketing money to let us know what in the heck the product does before we know whether or not we even want to find out about it in the first place. In this age of information overload, we shouldn't have to remember both the name and what the program does—the name itself should help categorize the product for us.

MUSIC BY YES

A small box showed up in my office recently with a letter claiming that the box contained an amazing invention. Just more computer hype, I thought. But after playing with the device and watching a videotape of some kids playing with it, I'm a convert. The product, which does not yet have an official name, is a music synthesizer and sound-sampling board for the Apple II series and a connector box for hooking the board up to speakers, a microphone, or your home stereo. The box sells for less than $100 and lets you play music from the Apple keyboard, create sound effects, digitize sampled sounds, and edit the sounds' waveforms. The product was created by Dr. Lloyd Yam of Yam Educational Software (YES), in San Mateo, California.

CD-ROM PARTNERSHIP

Apple is gearing up to adopt CD-ROM technology in a big way and has recently announced a technical-collaboration partnership with the National Geographic Society and Lucasfilm (of *Star Wars* fame) to explore the best ways to combine text, video, audio, film, and software to produce educational materials that use CD-ROMs and related technologies. We'll keep you posted on any new developments. +

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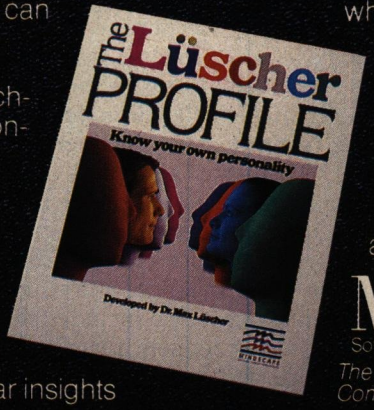

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CIRCLE 203 ON READER SERVICE CARD

COVER STORY *BY CHARLES RUBIN*

APPLE II ACCOUNTING

For a small business, computerizing the bookkeeping is often the primary reason for buying a computer. Once a company's books are on the computer, getting fast, accurate information about the state of the business is much easier. Although the benefits of computerized accounting are undeniable, however, most small-business owners don't know much about either computers or accounting. Accounting programs differ in the types of reports they produce, the numbers of accounts they allow, and the way they handle data, but most small-business owners don't know enough about accounting to know whether many of these features are necessary or helpful to them.

Aside from getting advice from other business owners or your accountant, the only way to determine which accounting program is for you is to assess your needs as well as you can and then look at what's available. The Apple II world has always had powerful accounting programs from which to choose, but there are fewer choices now than in the past. Of the remaining companies producing accounting software for the Apple II (see the chart that accompanies this article), BPI Systems, Manzanita Software, Peachtree, and H&E Computronics have captured the lion's share of the Apple II accounting market. Each of these companies produces Apple II accounting systems that try to combine ease of learning, ease of use, and business-level power.

BPI Entry Accounting Series

BPI has been making Apple II accounting software since 1979 and has always been known as the major player in this product category. BPI's Entry Accounting Series was chosen the best accounting software in the *A+* Readers' Choice poll for both 1984 and 1985. Currently, the Entry Accounting Series comes in both DOS 3.3 and ProDOS formats. The system can work with, but does not require, a hard-disk drive.

The Entry Accounting Series consists of five separate modules: General Accounting, Accounts Payable, Accounts Receivable, Payroll, and Inventory (the Inventory module isn't available in a DOS 3.3 version). The modules can run in an integrated system or individually. Each module sells for $395 (DOS 3.3) or $425 (ProDOS), meaning that you can spend more than $2000 for a complete accounting system with BPI products. The General Accounting module alone is designed to meet many of the needs of a small business, however.

The Apple II world has always had powerful accounting programs from which to choose.

According to BPI's director of marketing communications, Cheryl Seeman, "The reason it's called General Accounting and not General Ledger is that it contains not only a general journal and the normal ledger reports such as trial balance and income statements, but it also includes skeleton subsidiary ledgers for payables, receivables, and payroll. It also prints checks."

The skeleton payables, receivables, and payroll ledgers are adequate for a business that doesn't have a high volume or many employees, Seeman says. "The General Accounting system would be basically all that business needs," she says, "and then, of course, as the business expanded, it could add other BPI modules to increase its capability."

Although the skeleton ledgers let a business store basic data, they don't provide very many reports. The payables and receivables ledgers show the balance forward, the current month's activity, and an ending balance, but you can't produce detailed profiles or produce aging reports on receivables. For these extra reports and data, you need to add the separate receivables or payables modules that offer many advanced capabilities.

In the ease-of-learning/ease-of-use department, BPI offers some tutorial aids, along with a couple of features that help as you enter data. Each BPI module comes with a set of sample data, so you can practice using the system before risking your own figures. Unlike BPI's programs for the Macintosh and IBM PC, however, the Apple II versions don't have on-line help. Also, there's no on-line query facility that lets you look up account numbers if you forget them—you have to exit from the data-entry screen first.

On the other hand, two features help speed up data entry and report generation. You can set an account-prompt feature to supply a specific account number automatically whenever you enter a certain vendor or customer number. If you always send phone bills to the ABC Phone Company, for example, the telephone account number will always be filled in when you type

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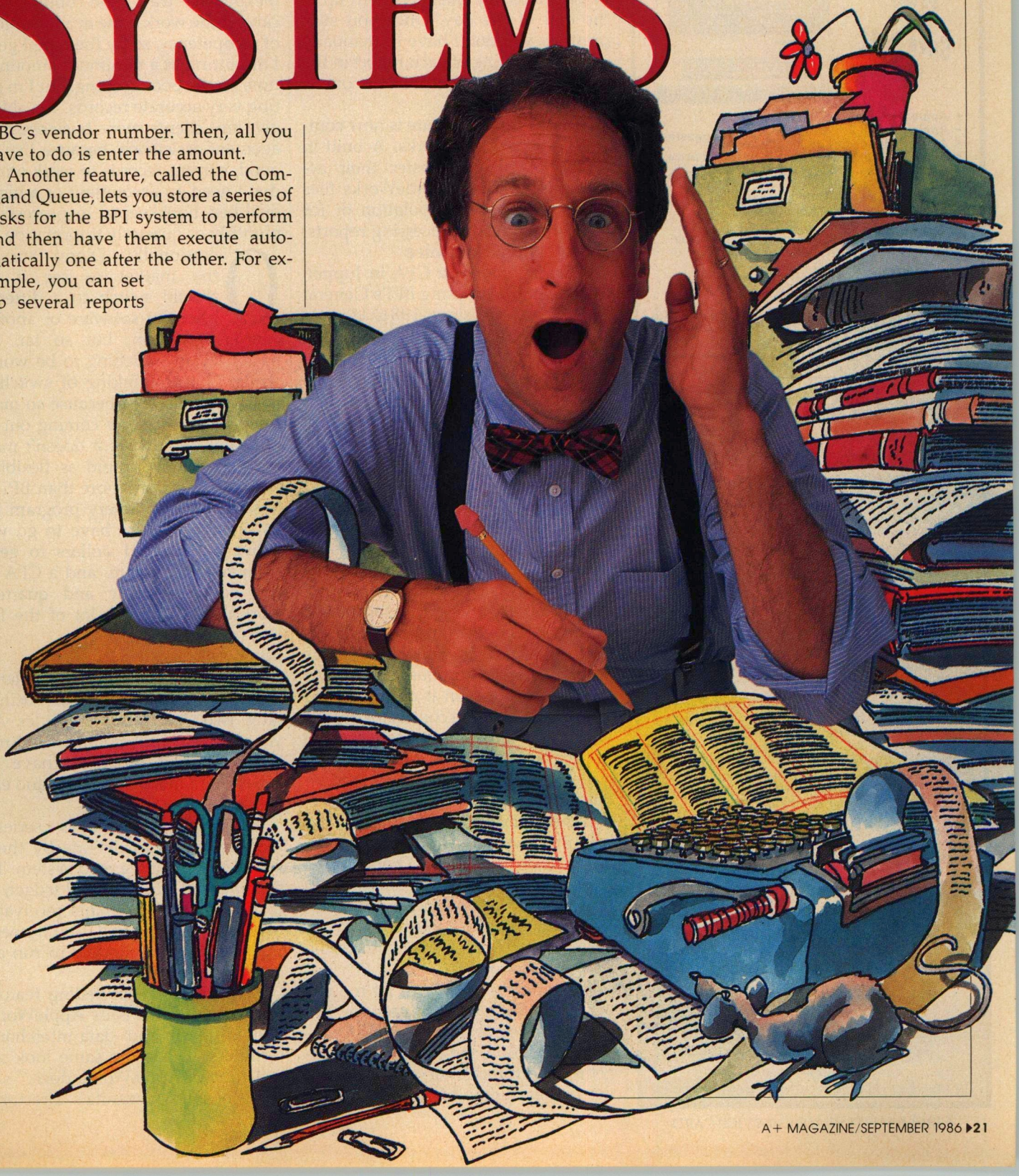
SYSTEMS

ABC's vendor number. Then, all you have to do is enter the amount.

Another feature, called the Command Queue, lets you store a series of tasks for the BPI system to perform and then have them execute automatically one after the other. For example, you can set up several reports



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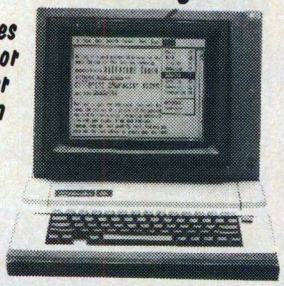

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CIRCLE 141 ON READER SERVICE CARD

BPI's General Ledger package 'has been one of the most reliable programs I've worked with, and the easiest to teach.'

to be printed by queuing them up at the end of the day. Once you start printing, you don't have to manually start the printing of each report in the queue whenever the previous one is finished.

Finally, BPI's software is now compatible with AppleWorks. A built-in utility lets users transfer their accounting data into AppleWorks files for spreadsheet manipulation or for inclusion in word-processing reports.

A Professional's Choice

Dorothy Diorio, a CPA in Jupiter, Florida, has been using BPI's General Ledger package since 1981. Her accounting firm serves 38 small-business clients on a monthly or quarterly basis, plus about 100 more year-end clients. Each client's books are stored on a different BPI system data disk. Her clients—including general construction contractors and subcontractors, retailers, professionals, and restaurateurs—represent a variety of different businesses.

"I'm very happy with the system," she says. "It gives me monthly financial statements and forms the basis of the tax return. I've got a substantial number of monthly and quarterly clients on it, and the versatility of this system lets me put just about any kind of business on it and get good information. With a contractor, for example, we have an extensive work-in-progress job file, and BPI's coding system lets me break the data down between direct and indirect costs."

When she prepares formal accounting statements for banks or other outside sources, Diorio uses AppleWorks. In the past, she's had to transfer the accounting information by hand, but she's expecting to receive BPI's AppleWorks-compatible upgrade any day.

"The new version will let me use the information directly from the BPI system," she explains. "I'm also hoping it will allow me to do some budgeting and forecasting, and it will let me save each month's work separately, so I can get a 12-month general ledger out of it." As it is, the BPI system closes out each month and doesn't maintain a historical record of each month's ledger.

Diorio has two Apple IIe computers in her office, which she shares with several employees. "This has been one of the most reliable programs I've worked with, and the easiest to teach—it gets out the information in a very quick and inexpensive way," she comments. "I can get the work done at a lower level of competency, so by the time I get it, I'm putting in a minimum amount of time on the bookkeeping, but I'm getting very accurate records. I'm able to give my clients more business-management assistance, because I've got good, current records to work with. I don't need an accountant or a highly qualified bookkeeper to process the monthly or quarterly information."

Occasionally, Diorio surveys the market to see if she should switch to a different brand of software or another computer system, but so far, she hasn't found switching to be worthwhile. "I was thinking of switching from Apple to IBM because so many more programs were coming out for IBM, but dollarwise, it doesn't make sense. I haven't found as flexible a program that does more than BPI for less than $1500. Every program has its drawbacks. You have to go well above a thousand dollars to get a comparable program, and a CPA office doing monthly and quarterly work doesn't need a lot of the features you get."

BusinessWorks

Manzanita Software is a relative newcomer, having been in business only two years, but its older Advanced Business Accountant and new BusinessWorks programs have received high marks for power and ease of use.

BusinessWorks is sold as a series of modules that can operate by themselves or as an integrated system. The modules include a general ledger, accounts payable, accounts receivable, inventory, and payroll. You'll need a System Manager module to run any other modules.

One of the major selling features of BusinessWorks is its AppleWorks-like interface and data-interchange facilities. "It has the same look and feel to it as AppleWorks does," says Jerry Jewell, Manzanita's director of

marketing. "It actually creates AppleWorks files from accounting data in any of the modules. It uses the same keystrokes and the same file-card metaphor on the screen. When you combine AppleWorks with our accounting packages, you have all the functions a computer can provide for a small business—database management, spreadsheets, word processing, and all the accounting modules are integrated, and you don't have to learn different keystrokes or menu structures. It's all the same, all the way through."

BusinessWorks' ease of use is apparent from the moment you set up the program the first time. The accounting module or modules install themselves on a UniDisk or hard disk in response to a couple of keystrokes. You can start out using only the general ledger and then add other modules later—BusinessWorks automatically takes notice of any new modules you've added.

Once you've set the program up, you can access on-line help that tells you what the program is doing and what it expects from you at any given point. The on-screen help facility also refers you to specific pages in the manual for further information.

Another helpful feature, called Show Windows, gives you pop-up windows when you type open-apple-?. These windows contain lists of vendor numbers, account numbers, customer numbers, and other vital information you may want to refer to as you enter data. If you're entering a general-ledger account number, for example, and you can't remember the right number, you can type open-apple-?, and a show window will display a list of the available account numbers. You can pick the one you want with the right- or left-arrow key and press Return, and the program automatically enters the account number and all related information into the data-entry screen.

Show windows present lists of all kinds of information, not just account numbers. If you want to enter something into an invoice and you can't remember the number of the invoice, you can ask for the show window; the window will come up and show you all the existing invoices for that particular customer. In short, the Show Windows feature eliminates the need to refer to written lists of vendor, customer, or account numbers and so makes data entry much faster.

BusinessWorks' ease of use is apparent from the moment you set up the program for the first time.

Like the BPI Entry series, BusinessWorks is an extremely powerful accounting system that produces dozens of different reports and posts entries to all the appropriate journals automatically. It can handle up to 20,000 journal entries a month and works with dollar amounts up to $43 million.

Adding Up Auto Sales

In Highland Park, Illinois, Bill Monnier runs an auto-sales business with the help of Manzanita's accounting software. Monnier has three Apple IIe computers on a Corvus network with two 11-megabyte hard disks. Before he bought Manzanita's Advanced Business Accountant (the predecessor of BusinessWorks), Monnier used Accounting Plus and BPI products. He now uses Manzanita's General Ledger, Accounts Payable, Accounts Receivable, and Payroll modules to keep track of his sales and his 12 employees.

Comparing the three accounting systems he's worked with on an Apple II, Monnier has been most impressed with Manzanita's software and personnel. "I've got more than a year under my belt with the latest system," he says. "I've been doing Apple II accounting for about four years. The Manzanita people have been most helpful whenever I've talked to them. They have a support hot line with an 800 number, and if they don't have the answer when I call, they get right back to me. With other companies, I used to spend a lot of time on hold, or I didn't get the answers I needed."

The program was also easier for him to start using than others. "The thing that knocked my socks off was that when we started the setup program, it was completely menu-driven and it automatically allocated itself to the areas of the hard disk that we specified by a menu—we didn't have to partition sectors. It was extremely easy to have working. I had another payroll program years ago and found

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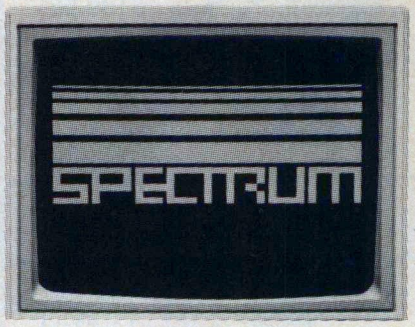

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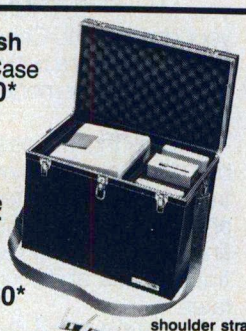

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it very cumbersome. We drove ourselves crazy. With the new system, going onto the Corvus [hard disk] was virtually automatic."

The system's ease of use was particularly important for Monnier when he hired a new clerk—he has three people who use the accounting system. "When I hired a new person, within several days she was operating the system, as far as doing payroll and whatnot, and within two weeks she never asked a question."

As far as his results are concerned, Monnier couldn't be happier. "If somebody wants to look at these records, they're added correctly, they're totally legible—there's just no comparison to the way they were five years ago." Even Monnier's accountant was impressed with the Manzanita system's capabilities. "His opinion of what we have and what we can generate is high. In fact, he's almost out of a job—I see him a lot less frequently, because we can generate our own reports and see what we've done wrong."

After some recent conversations with Manzanita, Monnier is considering an upgrade to BusinessWorks, so he can take advantage of the AppleWorks data compatibility and other features. "It allows more sales categories," he says. "The current system allows 8 sales categories, and BusinessWorks has 16. Even though this is a small business, we have in-state sales, out-of-state sales, service work, taxable, nontaxable, and so on. So we have several categories of sales we want to keep track of." BusinessWorks is also compatible with Catalyst and Pinpoint, but the older Advanced Business isn't.

Although he has three Apple systems on a network, Monnier can have only one person using BusinessWorks at a time. His wish list includes a multiuser version of the program, along with an Apple accelerator card that is compatible with his Corvus network.

Asked if he has any advice for new businesses just getting into computerized accounting, Monnier says, "It takes longer than you think it will before you get all your books running on the computer. Find a friend or make an acquaintance who knows something about computers (or preferably computers and accounting), and then be prepared to spend some time getting the system set up."

Back To Basics' main attraction is that it is a fairly complete small-business accounting system in one package.

Peachtree Back to Basics

Like BPI Systems, Peachtree has deep roots in Apple II accounting software, having sold its first program back in 1978. The current product, Back To Basics, has been on the market two years. Back To Basics' main attraction is that it is a fairly complete small-business accounting system in one package—you get Accounts Payable, Accounts Receivable, and General Ledger modules in one set for a total price of $195. You can use the three modules individually or together. The Apple II version of Back To Basics does not work on a hard disk.

"We say Back To Basics is really geared for the computer novice with little or no accounting experience," says Susan Craig, marketing manager at Peachtree. In view of that target market, Back To Basics offers a lot of fundamental accounting information to orient new users.

"Our documentation is probably one of our primary selling features," Craig explains. "We include an introduction to accounting—an accounting primer. We have a sample company that the user can go through, learning how to set up his business by using sample data. In fact, Kent Publishing has published an accounting workbook that works in conjunction with Back To Basics and is used in colleges and universities—that shows what a good educational tool it is. If it's easy enough to use to teach accounting, then it's very simple to use as far as the user is concerned, as well."

The Back To Basics software itself includes a predefined chart of accounts, so new users have a basic list of accounts to work with if they haven't set up their accounting before. You can expand or modify the listings as you gain experience.

Although it costs far less than competing systems, Back To Basics has most of the essential journals and reports that a small business needs. The general ledger includes a general

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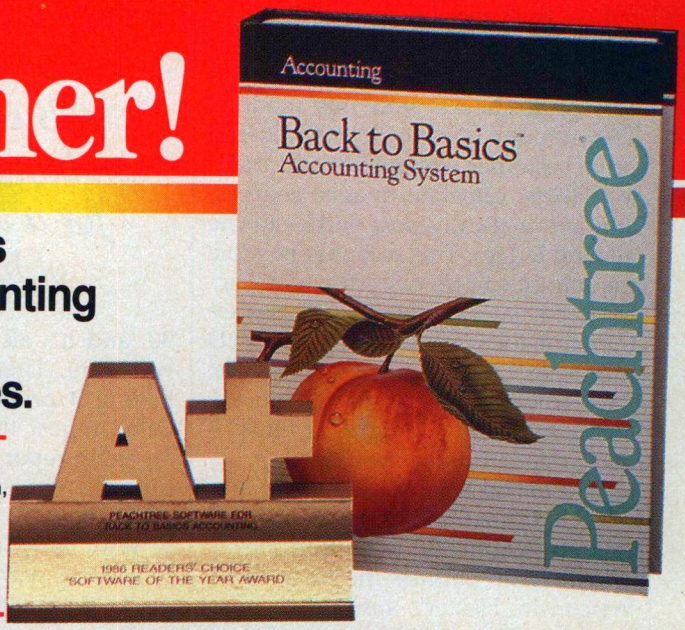

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GENERAL LEDGER
- On-line help displays Chart of Accounts.
- MTD and YTD show on income statements.
- Allows automatic Journal entries.
- Check processing and printing capability through Cash Disbursements.
- Optional cost of sales ranges.
- User modifiable Chart of Accounts included.
- Allows up to 3 checking accounts.
- Up to 10 departments with separate income statements.

ACCOUNTS RECEIVABLE
- Calculates receivables on balance forward basis.
- Prints statements and mailing labels.
- Allows automatic posting to General Ledger.
- Accepts partial payments.
- Calculates finance charges.
- Up-to-date customer information can be scrolled for review at any time.
- Customer ID's can be alpha or numeric.
- Verifies customer credit limit.
- Calculates up to 3 sales taxes per entry.

ACCOUNTS PAYABLE
- Up to 10 vendor payment terms.
- Calculates cash discounts.
- Accepts partial payments.
- Automatic posting to General Ledger.
- Prints vendor mailing labels.
- Up-to-date vendor information can be scrolled for review at any time.
- Customer ID's can be alpha or numeric.
- Prints computer checks or processes hand-written checks.
- Invoices automatically or manually selected for payment.

AND THESE ARE SOME OF THE REPORTS YOU GET WITH THE SYSTEM:

- Chart of Accounts
- Customer Master List
- Vendor Master List
- Trial Balance
- Detailed General Ledger
- Detailed Accounts Receivable
- General Journal
- Disbursements Journal
- Sales Journal
- Income Statement
- Balance Sheet
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journal, a cash-disbursements journal, a cash-receipts journal, and a cash-sales journal. You can maintain multiple cash accounts, and you can also print checks with this module. The accounts-receivable module can print customer statements and mailing labels, calculate finance charges, and automatically post entries to the general ledger. The accounts-payable module calculates cash discounts, accepts partial payments, and uses either alphabetic or numeric vendor ID numbers. Like Manzanita's system, Back To Basics can display a list of account numbers during data entry if you forget a number you need.

Power to the Novices

"For a small business, it does everything we need," says Ron Hester of Allenton Service in West Bend, Wisconsin. Hester's auto-repair business has five employees, and he's been using Back To Basics since early 1985.

Hester bought Back To Basics when he bought a IIe and has used his computer exclusively for accounting purposes. "We looked at BPI and State of the Art," he says, "and for what I got from Peachtree, I would've had to pay about $1500 with another system. Also, Peachtree was recommended to me by an accountant I know."

"Compared to some of the other programs, Back To Basics was really easy to use," Hester adds. "You don't have to format your data disk in a special way, and it's easy to understand the way the program comes up on the screen."

Starting with the work orders from his shop, Hester enters the accounts receivable into the computer. The system then breaks the receivables down into labor, parts, towing, and other accounts. Once he's entered the amounts, Back To Basics calculates the sales tax and posts the total to that account. When he wants to issue statements, he can issue them to a range of customers, to all customers with open balances, or only to past-due customers. With about 70 customer accounts, Hester says, "It saves me a lot of time."

Although he says he doesn't use most of the reports the system can generate, Hester finds it easy to get the data he wants. "If I want to know how much is outstanding in accounts receivable, I just ask the program, and it will tell me how much is 30–60 days past due, 60–90, and more than 90, and it's all totaled in columns if you want. There are several ways of having it printed out—there's a detailed report that lists each account, an aging report that just prints totals for each past-due period, and some others."

Despite their relatively low price, the VersaBusiness modules can handle accounting for a wide variety of businesses.

With Back To Basics, Hester is able to keep up with his billing paperwork easily, and he also has an easier time getting information to his accountant when tax season rolls around. "I just give him the statements I print with the system," he says.

Although he had little computer experience when he began, Hester was able to set up his books on Back To Basics and then grow with the system as he learned. "I would recommend it to anyone. After using it a year, I'm still finding extra things I can do with it."

The VersaBusiness Series

The VersaBusiness Series, made by H&E Computronics of Spring Valley, New York, is a reasonably priced set of accounting modules that packs a lot of power. The main module, called VersaLedger II, is a general-ledger system that handles multiple accounts, prints checks, and produces 17 different balance sheets, income statements, account listings, and other reports. The other modules handle payables, receivables, payroll, and inventory. You can use any module alone, or you can use modules together in an integrated system. The VersaBusiness series has been available for the Apple II since 1981.

Although several hundred dealers sell the VersaBusiness series, according to Janet Lasker, Computronics' dealer sales manager, a large portion of the firm's sales are through mail order. Although customers might be leery about buying accounting software through the mail, Computronics helps smooth the way. You can purchase the manual for any module separately for $25 and then apply that amount to the purchase of the software if you decide to buy it. Also, Computronics offers a 30-day money-back guarantee on all of its software, and you get 60 days' free technical support with the purchase of any module.

Despite their relatively low price, the VersaBusiness modules can handle accounting for a wide variety of small- and medium-sized businesses. The software comes in both DOS 3.3 and ProDOS versions, and the ProDOS version can work on a hard-disk drive. The VersaLedger module can handle up to 615 different accounts (the number of transactions is limited by disk space), and the payables and receivables modules can handle up to 2000 accounts each on a hard-disk system. The software is not copy-protected, so you never have to worry about having a backup copy.

Watching the Inventory

At Antique Timepieces in San Anselmo, California, proprietor Drew McEachern was having trouble keeping track of some 350 watch, clock, and jewelry parts in his watch- and jewelry-repair business until he bought VersaInventory. "I have about 350 different items in inventory," he says, "and I was basically trying to keep track of them all in my head."

McEachern added VersaInventory to his Apple IIe and Sider hard disk about two years ago and soon had much more control over his stock. "It's been great," he says. "It's set up in a spreadsheet format, and you can print out a report showing the total number of items and their total dollar value, so you always know how much stock you have on hand. You tend to forget that you need X dollars' worth of inventory to do X dollars' worth of business, but at the same time you don't want to have all your money tied up in inventory. This program helps me maintain a balance between having enough stock and having either too much or too little."

It took McEachern about a month to become completely comfortable with the program, but that, he says, is due to its power. "You can have a couple of thousand items in inventory, and there are a lot of ways you can look at what you have." Between Computronics' manual and what he describes as "very helpful" customer support, however, McEachern found the transition from no inventory system to a computerized one fairly painless. All of his questions to Computronics' customer-support service were answered

within the 60-day free support period, so he has never had to pay for additional help.

Although his other accounting data is currently maintained by a bookkeeper, McEachern is planning to upgrade to VersaLedger, VersaPayables, and VersaReceivables. "I want to try to run a computer system in parallel with my bookkeeper for a couple of months," he says, "and then, I hope, switch over to the computer completely."

Depending on your level of accounting experience, the complexity of your business, your budget, your hardware, and the amount of time you're willing to spend computerizing your books, one of these four programs will do the job. Accounting was one of the first applications to appear on Apple computers, and today's Apple II accounting-software vendors don't take a backseat to anybody else when it comes to managing your books. ✚

A+ *contributing editor Charles Rubin is the author of* Command Performance: AppleWorks, AppleWorks, *and* The Endless Apple, *all from Microsoft Press.*

PRODUCT INFORMATION

The Entry Accounting System
BPI Systems
3001 Bee Cave Road
Austin, TX 78746
(800) 531-5252
List Price: DOS 3.3 version, $395 per module; ProDOS version, $425 per module
Requires: DOS 3.3 version: Apple II, II Plus or IIe; ProDOS version: Apple II Plus, IIe, or IIc (II and II Plus require Videx VideoTerm card; IIe requires Apple 80-column card)
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Back To Basics
Peachtree Software, Inc.
4355 International Blvd.
Norcross, GA 30093
(404) 564-5700
List Price: $95 per module or $195 for all modules (general ledger, accounts payable, and accounts receivable)
Requires: Apple II Plus, IIe, or IIc; 64K RAM; two disk drives
CIRCLE 467 ON READER SERVICE CARD

BusinessWorks
Manzanita Software Systems
1 Sierra Gate Plaza, Suite 200-A
Roseville, CA 95678
(916) 781-3880
List Price: System Manager, $95; Payroll, $445; other modules, $395
Requires: Apple IIe with 128K RAM and 80-column card, or IIc; ProDOS; two 3.5-inch disk drives, or one 3.5-inch disk drive with 512K RAM or hard disk
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The VersaBusiness Series
H&E Computronics, Inc.
50 North Pascack Road
Spring Valley, NY 10977
(800) 431-2818
In NY (914) 425-1535
List Price: VersaLedger, $149.95; other modules (VersaReceivables, VersaPayables, VersaPayroll, and VersaInventory), $99.95 each
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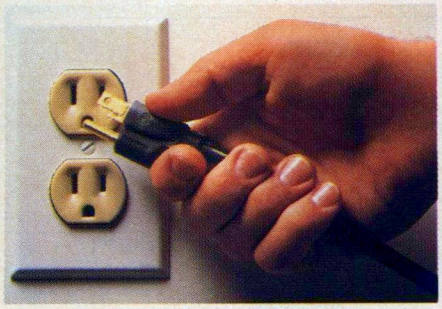

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BACK TO BASICS ACCOUNTING SYSTEM Peachtree Software, Inc. 4355 International Blvd. Norcross, GA 30093 (800) 247-3224; in GA (404) 564-5800	■	■	■		**INVOICING** **INVENTORY**
BOOKS! THE ELECTRIC LEDGER Systems Plus, Inc. 500 Clyde Avenue Mountain View, CA 94043 (415) 969-7047	■	■	■		**INVOICING** **CHECK WRITING** **RECURRING ENTRIES** **BUDGETING**
BPI ENTRY SERIES BPI Systems, Inc. 3001 Bee Cave Road Austin, TX 78746 (512) 328-5434	■	■	■	■	**INVENTORY** **(ProDOS ONLY)**
THE BUSINESS ACCOUNTANT Decision Support 1300 Vincent Place McLean, VA 22101 (703) 442-7900	■	■	■	■	
THE BUSINESS ACCOUNTANT Manzanita Software Systems 1 Sierra Gate Plaza, Suite 200A Roseville, CA 95678 (916) 781-3880	■	■	■	■	**INVENTORY**
BUSINESSWORKS Manzanita Software Systems 1 Sierra Gate Plaza, Suite 200A Roseville, CA 95678 (916) 781-3880	■	■	■	■	**INVENTORY**
DESKTOP ACCOUNTANT Rocky Mountain Software Systems 1280C Newell Avenue Walnut Creek, CA 94596 (415) 680-8378	■	■	■	■	
GENERAL LEDGER SBCS 3815 Adams Street Lincoln, NE 68504 (402) 467-3591	■				
HAL SOFTWARE HAL Software P.O. Box 1086 Poulsbo, WA 98370 (206) 598-4728	■	■	■	■	
HARDISK ACCOUNTING SERIES, V. 3.03A Great Plains Software 1701 SW 38th Street Fargo, ND 58103 (701) 281-0550	■	■	■	■	**INVENTORY** **JOB COST**
PERFORMANCE SERIES Westware, Inc. 65 East 400 South Orem, UT 84058 (801) 226-8926	■	■	■	■	**INVENTORY**
SUCCESS DESK ACCOUNTING SYSTEM CMA 55722 Santa Fe Trail Yucca Valley, CA 92284 (619) 365-9718	■	■	■	■	
VERSA BUSINESS SERIES H&E Computronics, Inc. 50 North Pascack Road Spring Valley, NY 10977 (800) 431-2818; in NY (914) 425-1535	■	■	■	■	**INVENTORY**
WOS FUND ACCOUNTING WOS Data Systems, Inc. 455 Austin, P.O. Box 744 Colby, KS 67701 (913) 462-7581	■			■	**PO VOUCHER**

As this chart illustrates, numerous accounting programs are available for the Apple II series. The 15 programs detailed here represent a wide variety of prices, abilities, and complexity. The chart provides several important statistics on each program, as well as a checklist of major features.

MAXIMUM NUMBER OF ACCOUNTS	MULTIPLE DEPARTMENTS FOR EACH COMPANY	MULTIPLE-COMPANY PROCESSING	MULTIPLE-COMPANY CONSOLIDATION	ACCOUNTING PERIODS	POSTING TO MULTIPLE ACCOUNTING PERIODS
450–500 DEPENDS ON DISK SPACE	99	■	■	ANY NUMBER	
GENERAL LEDGER, 254; ACCOUNTS RECEIVABLE & ACCOUNTS PAYABLE, 300 EACH	UP TO 10			12	
65,000	UNLIMITED	■	■	12	■
DOS 3.3: GL, 1000; AR & AP, 450 EACH; PAYROLL, 100—ProDOS; GL, 1000; AR & AP, 9999 EACH; PAYROLL, DEPENDS ON DISK SPACE: INVENTORY (WITH FLOPPY DISK), 850; INVENTORY (WITH HD), DEPENDS ON DISK SPACE	10	■		12	
200	63		■	12	■
500	99	■		12 AND/OR 13	■
1000	99	■		12 AND/OR 13	■
400/MODULE; 256K VERSION, 2200	99	WITH MULTI-COMPANY OPTION		ANY NUMBER	
450–500 DEPENDS ON DISK SPACE	9	■	■	ANY NUMBER	
GL, 2000; AR, 400; AP, 200; PAYROLL, 300	GL, 255 PAYROLL, 15	■	■	12 AND/OR 13	■
GL, 2000; AR & AP, 3000 EACH; PAYROLL, 500; INVENTORY, 6000	999	WITH MULTI-COMPANY OPTION	■	12	■
GL, 3300; AR, 7700; AP, 800; PAYROLL, 90; INVENTORY, 10,000	36	WITH MULTI-COMPANY OPTION		12 AND/OR 13	
500	5			12 AND/OR 13	
FLOPPY: GL, 615; AR, 400; AP, 200; INVENTORY, 855—HD: GL, DEPENDS ON DISK SPACE: AR, AP, PAYROLL, & INVENTORY, 2000 EACH	UP TO 99	■		12 AND/OR 13	
DEPENDS ON DISK SPACE	UNLIMITED	■	■	12 AND/OR 13	■

CONTINUED→

THE APPLE II ACCOUNTING LINEUP

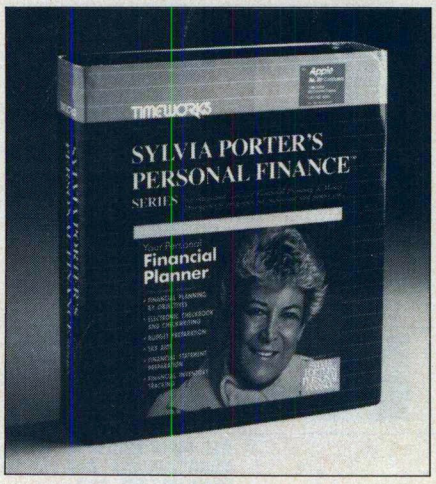
CONTINUED FROM PAGE 29

	AUTOMATIC POSTING OF RECURRING TRANSACTIONS	AUTOMATIC GENERATING OF REPEATING ENTRIES	AUDIT TRAILS FOR ALL TRANSACTIONS	BUDGETING BY ACCOUNTING PERIODS
AGRI-LEDGER SBCS 3815 Adams Street Lincoln, NE 68504 (402) 467-3591			■	■
BACK TO BASICS ACCOUNTING SYSTEM Peachtree Software, Inc. 4355 International Blvd. Norcross, GA 30093 (800) 247-3224; in GA (404) 564-5800	■		■	
BOOKS! THE ELECTRIC LEDGER Systems Plus, Inc. 500 Clyde Avenue Mountain View, CA 94043 (415) 969-7047	■	■	■	■
BPI ENTRY SERIES BPI Systems, Inc. 3001 Bee Cave Road Austin, TX 78746 (512) 328-5434	■	■	■	
THE BUSINESS ACCOUNTANT Decision Support 1300 Vincent Place McLean, VA 22101 (703) 442-7900	■	■		
THE BUSINESS ACCOUNTANT Manzanita Software Systems 1 Sierra Gate Plaza, Suite 200A Roseville, CA 95678 (916) 781-3880	■	■	■	■
BUSINESSWORKS Manzanita Software Systems 1 Sierra Gate Plaza, Suite 200A Roseville, CA 95678 (916) 781-3880	■	■	■	■
DESKTOP ACCOUNTANT Rocky Mountain Software Systems 1280C Newell Avenue Walnut Creek, CA 94596 (415) 680-8378	■		■	
GENERAL LEDGER SBCS 3815 Adams Street Lincoln, NE 68504 (402) 467-3591			■	■
HAL SOFTWARE HAL Software P.O. Box 1086 Poulsbo, WA 98370 (206) 598-4728	■	■	■	■
HARDISK ACCOUNTING SERIES, V. 3.03A Great Plains Software 1701 SW 38th Street Fargo, ND 58103 (701) 281-0550	**GL & AR, YES; AP, NO**	■	■	■
PERFORMANCE SERIES Westware, Inc. 65 East 400 South Orem, UT 84058 (801) 226-8926		■	■	■
SUCCESS DESK ACCOUNTING SYSTEM CMA 55722 Santa Fe Trail Yucca Valley, CA 92284 (619) 365-9718	■	■	■	■
VERSA BUSINESS SERIES H&E Computronics, Inc. 50 North Pascack Road Spring Valley, NY 10977 (800) 431-2818; in NY (914) 425-1535	■	■		
WOS FUND ACCOUNTING WOS Data Systems, Inc. 455 Austin, P.O. Box 744 Colby, KS 67701 (913) 462-7581	■	■	■	■

REPORTS WITH ACTUAL VS. BUDGETED FIGURES	PRIOR-YEAR COMPARISONS	PASSWORD SECURITY	PRICE	SYSTEM REQUIREMENTS (NONE OF THE PROGRAMS ARE COPY-PROTECTED)
■	■		$550	II PLUS, IIe, IIc, OR III (IN NATIVE MODE); DOS 3.3
	■	■	$195	II PLUS, IIe, OR IIc; 64K RAM; TWO DISK DRIVES
■	■	■	BASIC PACKAGE, $395; OPTIONAL MODULES, $895	II PLUS, TWO DISK DRIVES OR HARD DISK (HD), DOS 3.3
		■	DOS 3.3 VERSION: $395/MODULE; ProDOS VERSION: $425/MODULE	DOS 3.3: II, II PLUS, OR IIe, 48K RAM; ProDOS: II PLUS, IIe, OR IIc, 64K RAM (II & II PLUS NEED VIDEX VIDEOTERM; IIe NEEDS APPLE 80-COL. CARD)
		■	$255, 50% OFF THROUGH 9/30/86	II, II PLUS, IIe, OR IIc; 64K RAM; DOS 3.3
■	■		$295/MODULE; PAYROLL, $345	IIe OR IIc; 128K RAM; TWO DISK DRIVES; DOS 3.3
■	■	■	$395/MODULE; PAYROLL, $445; SYSTEM MANAGER (REQUIRED), $95	IIe OR IIc, 128K RAM, TWO 3.5-INCH DISK DRIVES OR ONE 3.5-INCH DISK DRIVE PLUS 512K RAM OR HD; ProDOS
	■		ALL FOUR MODULES, $395; $250/MODULE: MULTICOMPANY OPTION, $50	II, II PLUS, OR IIe; 64K RAM; CP/M SOFTCARD: MICROSOFT BASIC
■	■	■	$349	II PLUS, IIe, OR IIc; TWO DISK DRIVES, DOS 3.3
■	■	■	GL WITH PAYABLES, $325; AR, $50 (UNSUPPORTED, BEING SOLD OUT); PAYROLL, $275	II, II PLUS, IIe, OR IIc; 64K RAM; TWO DISK DRIVES (HAS OWN OPERATING SYSTEM)
■	■	■	$695/MODULE	IIe WITH 128K RAM OR III WITH 256K RAM; PROFILE, QUARK, CORVUS, OR SPACE COAST SYSTEMS' ICE HD; ProDOS
■	■	■	$1995	IIe, TWO DISK DRIVES OR HD, DOS 3.3 OR ProDOS
■	■	■	$349.95	II PLUS, IIe, OR IIc; TWO DISK DRIVES; DOS 3.3
			GL, $149.95; OTHERS, $99.95	II PLUS, IIe, OR IIc; TWO DISK DRIVES OR HD; DOS 3.3 OR ProDOS
■	■	■	WHOLE PACKAGE, $4995; PO VOUCHER (REQUIRES GL), $1500; GL & REVENUE EXPENDITURE, $1700; PAYROLL, $2570	IIe, 128K RAM, CORVUS OR SPACE COAST SYSTEMS' CHALLENGER HD

PORTER

Two financial wizards have packaged their



BY KEN LANDIS

SYLVIA PORTER

Psychoanalyze your finances with Sylvia Porter's Your Personal Financial Planner—a slickly packaged set of financial tools from the Freud of financial planning.

You used to have to win the lottery or the Irish Sweepstakes before financial planners descended on you in droves. Today, you don't have to be wealthy, win something, or come into an inheritance to plan your finances—all you need is a computer.

If psychoanalysis was the "in" thing to do in the 70s, financial planning is its 80s counterpart. So let's have a session with the Freud of financial planning, Sylvia Porter. The software is called Sylvia Porter's Your Personal Financial Planner; I'll just refer to it as The Planner.

The Planner is a slickly packaged set of financial tools. It includes a transaction manager, budget manager, asset/liability manager, an income and expense reporter, a personal balance sheet, and a financial planner. Weaving these all together is the responsibility of The Main Program. These sections, or modules, of the program form a fairly comprehensive, but not complete, system. Let's look at each one and see what Porter and company have done.

The transaction manager is your personal general ledger. It tracks where your money comes from, where it goes, and why. You give each source or use of funds a two-digit identifier. Once you have established all your accounts (you can modify them at any time), you're ready to start entering transactions.

By simply pulling down a menu (these Mac-like menus appear throughout the program), you can add transactions. This section of the program is modeled after your check register. You enter the same information that you would put into your checkbook, and a little bit more.

With the transaction manager, you can easily reconcile your checkbook, make automatic payments (such as car, rent, or mortgage payments), write checks, and do just about any kind of analysis imaginable on your payments and deposits. The trick is keeping the system up to date, and that takes a lot more work than writing a check at the grocery store does. Your checkbook doesn't let you construct your own reports, but the Planner does—a unique feature that deserves applause.

The budget manager is as tenacious as any greedy relative would be in watching your spend your money. The budgets are divided into 14 categories (just about anything I can think of can fit into them), and each category can be divided into ten subcategories.

For each category, you can see what percent of the total budget the expense represents, the budget itself, your actual expenses, the percent of actual expenses, and the dollar and percent difference. Great stuff, even if it is depressing to see you've spent more than you wanted to.

If you're really masochistic, or if you've been good and want to reward yourself, you can take any category and look at it as a bar chart right on the screen or look at all the categories on a sideways bar chart measured in percentages of your total budget.

If you're constantly wondering how you're doing vs. the Joneses, then the asset/liability manager is for you. Watch your wealth (assets) and your debts (liabilities) go up and down. As with the transaction manager, you can write your own reports.

If you were a public corporation, you would have to issue a basket full of financial statements, including an income statement and a balance sheet. Welcome, shareholder, to Me (You), Inc. The Planner can produce a personal income statement and balance sheet just for you. These reports are so good that you can probably wow your banker with them.

Up to this point, Your Personal Fi-

(Continued on page 36)

VS. TOBIAS

magic in software programs for the Apple II.

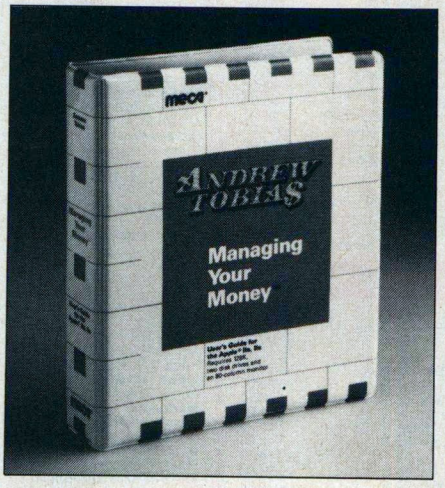
Personal money management is like exercise. We know it is good for us, but most of us never get around to actually doing it on a regular basis.

Andrew Tobias/Managing Your Money sets out to prove that anyone can use powerful financial-analysis tools—and have fun doing it.

Managing your Money is an integrated set of programs that help home-computer users perform essential financial planning and record keeping. Taken together, the programs offer an impressive array of tools. Unlike many financial and investment packages, MYM is for people who don't know a whole lot about either financial analysis or computers.

Andrew Tobias, author of *The Only Investment Guide You'll Ever Need* and other books, has earned a reputation for the clarity and good humor of his financial writing. Miraculously, Tobias, who is not a programmer, and MECA (Micro Education Corporation of America) have teamed up to create software that delights, educates, and also gets the job done.

Managing your Money consists of these nine integrated programs: (1) A tutorial that demonstrates all the commands and data-entry techniques that you need to use the program. (2) A reminder pad to keep track of your calendar. (3) Budget and Checkbook, which keeps watch on your personal cash flow. If you are really adventurous, the software can actually write and address your monthly checks. MYM provides the names of three check vendors that will print customized checks for you that are compatible with the checking account at your bank. (4) Tax Estimator, modeled after a 1040 form, which can handle schedules A, B, C, D, E, G, and W, as well as the Alternative Minimum Tax. (5) Insurance Estimator, which actually makes insurance fun. Who among us can resist the temptation to ask our Apple to compute our life expectancy? (6) Financial Calculator, which answers mind-boggling questions clearly. It can quickly calculate your mortgage or loan payments, the yield at maturity of a bond, or what your IRA will be worth in 20 years. Powerful subsections give you answers about real estate, tax shelters, and loan analysis. (7) Portfolio Manager, which keeps track of all of your assets and also allows for fast analysis of portfolios to help you minimize the effects of taxation and make better investment decisions. (8) Net Worth, which uses information from the other programs to compile your up-to-date, personal balance sheet. (9) And, finally, Housekeeping, which provides the utilities to quickly format and copy disks and match up to your printer.



BY MICHAEL SHAPIRO

ANDREW TOBIAS

Andrew Tobias carries on his reputation for clarity and humor in Managing Your Money, financial software that delights, educates, and also gets the job done.

Managing Your Money is very easy to learn and use. The program is menu-driven, and each screen is not only well designed and thoroughly prompted but also has its own help screen. The help screens and the manual were written by Andrew Tobias and so are concise, clear, and often funny.

Another nice thing about this package is that it comes loaded with data from the "Sample" family. The folks at MECA know that you will learn faster by seeing what a program can do than by reading about it in the abstract. Detailed instructions tell you how to delete this data once you've become familiar with the software.

Managing Your Money was originally created for PC-DOS machines, and the Apple version is a translation. Selecting menu choices requires that you press both the open apple (or closed apple) and a number key—a minor inconvenience.

The only real drawback is the large number of disks that you need to use

(Continued on page 38)

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Signalman Lightning 2400	355.00
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Hayes 300 Baud Smartmodem //c	159.00
Hayes 300 Baud Smartmodem	139.00
Hayes 1200 Baud Smartmodem	359.00
Hayes 2400 Baud Smartmodem	579.00
Transet 1000	269.00
Novation Novation Apple Cat II	189.00
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Z-Engine 2.2	125.00
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RamFactor *(256K to 1MB)*	Call
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Information Appliance SwyftCard	69.00
Micro Sci Micro Sci 80/64e	69.00
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MCT MTC Speed Demon	155.00
Titan Industries Saturn 128K Ram	175.00
Accelerator //e w/PinPoint	219.00

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Multi I/O Clock/Calendar/2 Ser. Ports	139.00
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Quadram Multicore w/0K	149.00
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Super Serial Card	92.00
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Pkaso/U Interface	125.00
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X-10 Powerhouse Computer Interface	49.00
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Color Enhancer //c w/Dazzle Draw	89.00
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Screen Enhancer //c	55.00

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Curtis Emerald	36.00
Curtis Ruby	54.00
Curtis Sapphire	47.00
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Apple Mouse //c	85.00
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The Cricket //c	69.00
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LX-80	Call	Call
DX-10/20	For	Call
FX-85	Most	Call
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LQ-800/1000	Low! Low!	Call
SQ-2000	Prices	Call

Juki	
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Okidata Okimate 20 Color Printer	Call
Microline 182P or 183P	Call
Microline 192P or 193P	Call
Microline 292 or 293P	Call
Microline 192 Apple or 193 Apple	Call
Panasonic	
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KXP-1592 *(160 cps)* NLQ Mode	429.00
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P-351 24 Pin *(288cps) Par./Ser. 15"*	1079.00

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AST Research	
MicroStor 10MB Tape Backup Only	955.00
MicroStor 10MB Hard Disk Only	955.00
MicroStor 10MB Hard Disk w/10MB Tape Backup	1475.00
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A5 Slimline //c	159.00
Micro Sci C2 Controller	55.00
Mitac AD-1 Full Height //e	139.00
AD-3C Slimline //e or //c	129.00
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Video 300A 12" Amber Monitor	125.00
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Color Monitor 722 *(RGB)*	499.00
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C-Vue Flat Panel Display (Apple //c)	359.00
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SA-1000 Amber	139.00
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Shipping Charges — Software Only — $3.00 Minimum charge U.S. Mainland. With C.O.D. shipments add an additional $2.00. U.S. Postal, APO, and FPO add 3% ($5.00 Min.). Alaska or Hawaii add 6% ($10.00 Min.). Canadian orders add 10% ($15.00 Min.). Foreign Orders except Canada—Add 18% ($25.00 Min.).

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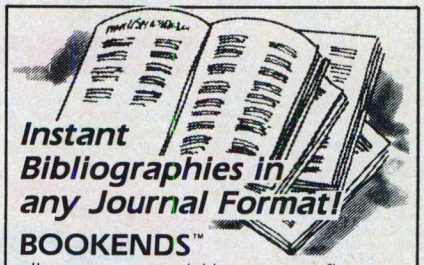
Supports the Imagewriter and Scribe printers directly (depicted grid style is available for these printers only). Other dot matrix printers require graphics capable interface card or separate support software.



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CIRCLE 165 ON READER SERVICE CARD

SYLVIA PORTER

(Continued from page 32)

nancial Planner hasn't broken any records—it simply does what many other programs have done before it, except it does it in an integrated fashion. It's nothing more than a personal general-ledger and accounts-payable system. Although nothing is wrong with that, that's not the reason you would be interested in this program. You would buy it to plan your finances, an area in which we expect Sylvia Porter to excel. She's let us down, though. The Financial Planner module could and should be renamed the Financial Historian. It tells you a lot about the past and the present, but it doesn't help you plan for the future—that must be somebody else's job.

You tell your Apple a lot about

The Planner can produce a personal income statement and balance sheet just for you.

you, and it tells you the same thing back, except that it formats it nicely. Nowhere does the program tell you what kind of insurance you should have, what kinds of investments you should consider, what the risks are, any tax implications, and so on.

When it comes to this program, Sylvia Porter and Timeworks should hang a new shingle outside their offices and change the name of the software. Instead of Sylvia Porter's Your Personal Financial Planner, the program should be Sylvia Porter's Personal Financial Bookkeeper. It's the wrong program for the right job. ✚

Ken Landis has been a consultant since 1978. He has published more than 100 articles on the use of computers as business or personal tools.

PRODUCT INFORMATION

Sylvia Porter's Your Personal Financial Planner
Timeworks, Inc.
444 Lake Cook Road
Deerfield, IL 60015
(312) 948-9200
List Price: $49.95
Requires: Apple IIe or IIc, 128K RAM

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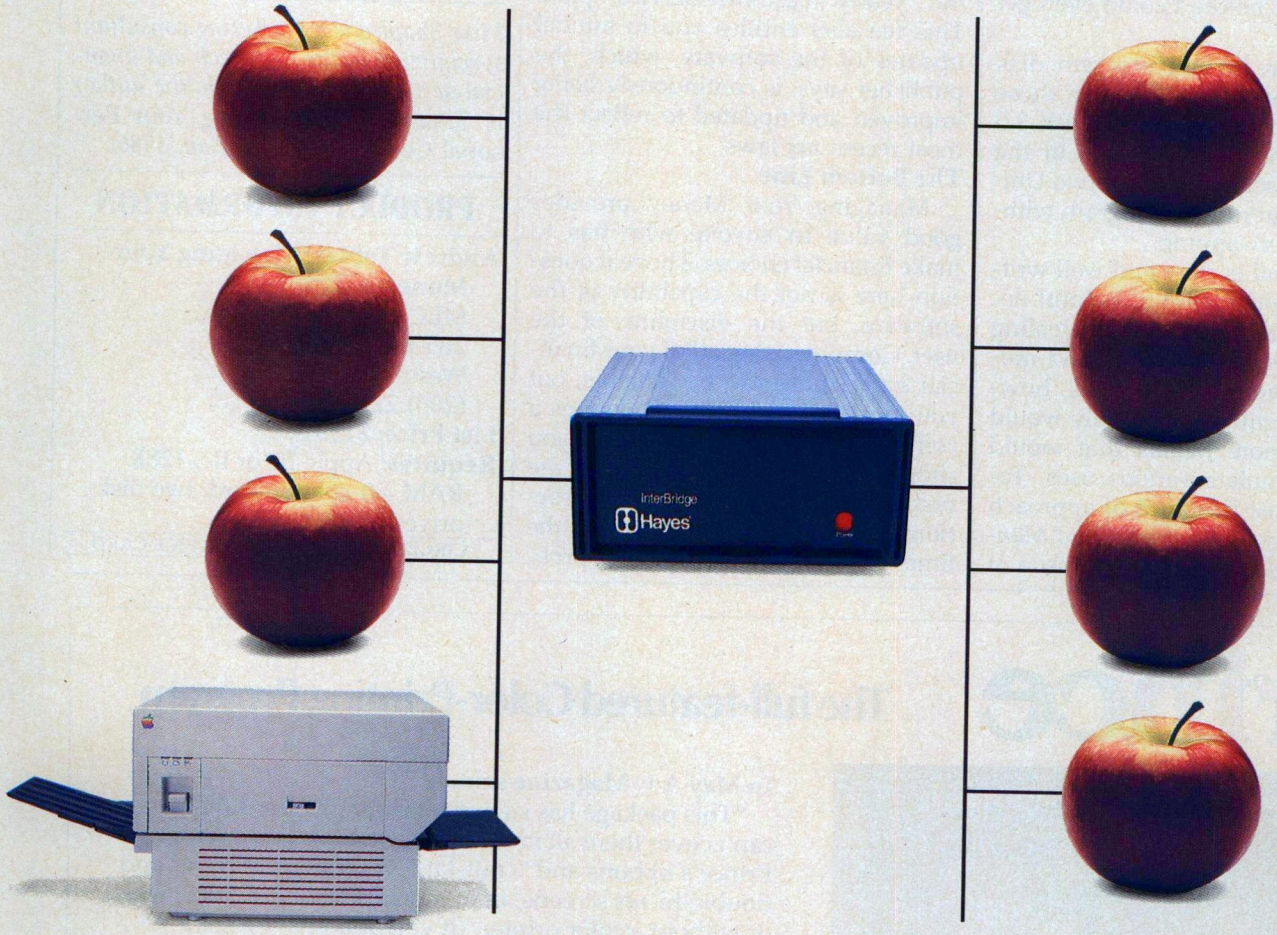
AppleTalk™ networks communicate better after a little bridgework.



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CIRCLE 296 ON READER SERVICE CARD

ANDREW TOBIAS

(Continued from page 33)

the program, a problem that results from the low capacity of the Apple IIe disk drives, rather than the program itself. The program comes on both sides of three flippy disks. Following the instructions, I made copies on six floppy disks. I also created four storage disks: for budgets, portfolio, main data, and archived budget data. That was ten disks before I could even get started!

Once you're into the program, disk swapping goes smoothly. For those lucky enough to have a UniDisk 3.5 drive, a 3.5-inch disk comes in the package. In fact, if you have two UniDisks, you can run the program without any disk swapping.

The manual is clear and well written and provides a lot of helpful details on special areas such as dealing with mergers, short selling, and mutual-fund investments. I think, however, that beginners especially would appreciate more details that would serve to stimulate various uses. Tobias offers just this kind of approach in a quarterly newsletter called *Managing Your Money Better*, one issue of which is bound into the manual. To continue to receive the newsletter, though, you have to spend $39.95 for the yearly customer-service plan. This fee also entitles you to annual updates of the software, which, the publisher says, is continuously being improved and updated to reflect the most recent tax laws.

Managing Your Money provides good value to anyone who has to make financial choices.

The Bottom Line

Managing Your Money provides good value to anyone who has to make financial choices. The real question here is not the capability of the software, but the discipline of the user. Computerizing all of your financial transactions can be valuable, but you must be aware that it requires a commitment. To do it right, you should start using the program at the first of the year and record transactions continuously. Although the time commitment of doing so is probably only an hour or two a week, you have to do it *every* week. If you don't, your data will be valueless.

If you are not this serious, don't despair; you can use this package just for fun. For example, Managing Your Money is glad to answer questions such as this one: If on the day Christ was born, I had invested 1 penny at 2% per year interest, what would my investment be worth today. Answer: $117 quadrillion dollars. ✚

Mike Shapiro is a marketing consultant specializing in the high-tech and financial-services markets. He is the author of Smart Investing Using Your Personal Computer *(Macmillan, 1986).*

PRODUCT INFORMATION

Andrew Tobias/Managing Your Money
MECA
285 Riverside Avenue
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List Price: $199
Requires: Apple IIe or IIc; 128K RAM; 80-column card; two disk drives

CIRCLE 388 ON READER SERVICE CARD

Prince

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"This package has so many printing options that we can't cover them all in the space we have here. With Prince's ribbons and "craft-kit," you can print hi-res and double-hi-res screens, in monochrome or full color, with or without a color printer. (If you don't have a color printer, you'll have to change ribbons for each color pass.) In addition to conventional screen dumps, you can print iron-on transfers (the Transfer option flops your image), labels (the Label option adjusts the printout to fit on 3.5-inch-wide label stock), and greeting cards (the left half of the image appears on the front of the card, and the right half appears inside the card when it's opened).

Using Prince, you can edit your images (scroll, crop, erase, and add text) and then choose from a variety of printing options. The Expert Print mode has 18 optional printing parameters, including margins, size, placement, rotation, density, and so on.

Prince is, indeed, a prince of a printing program."

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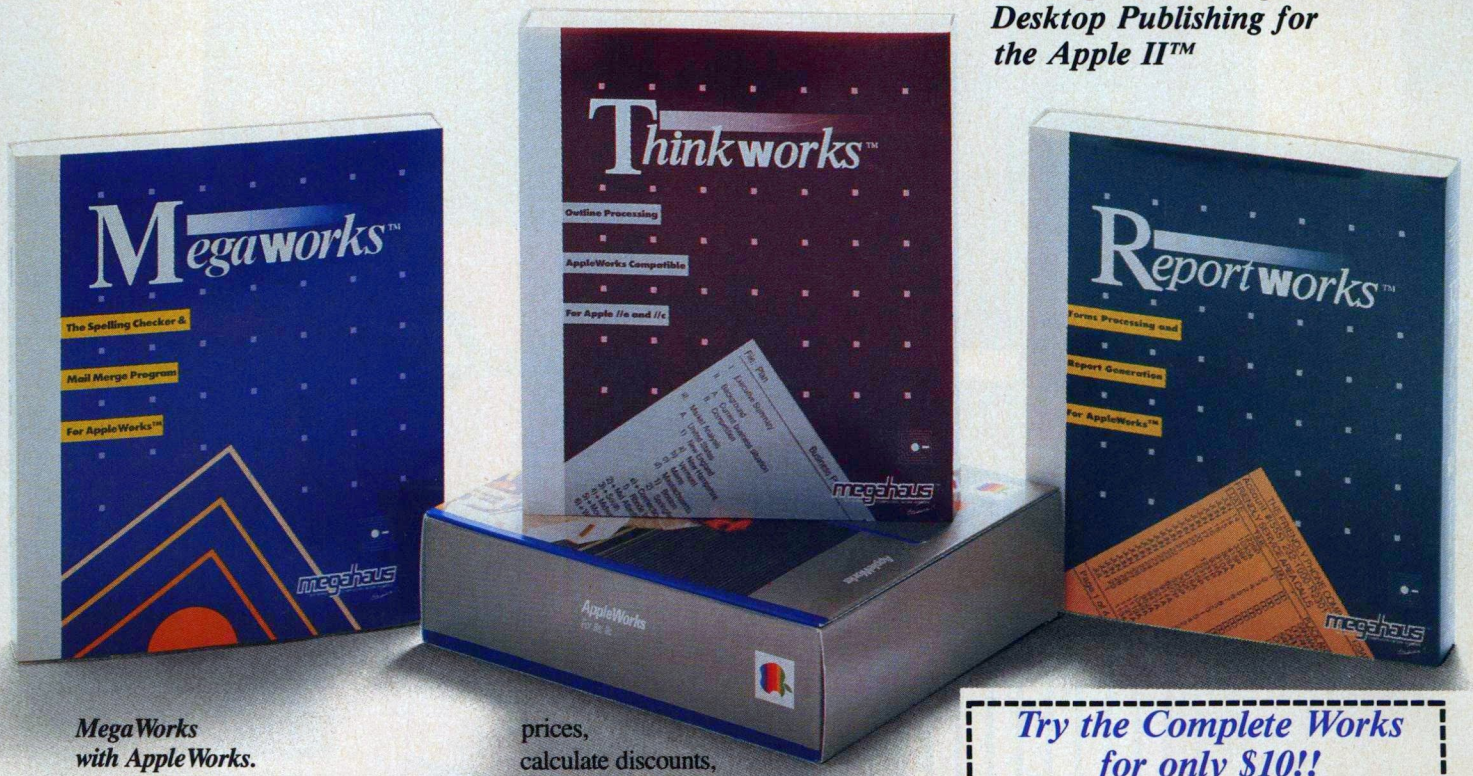

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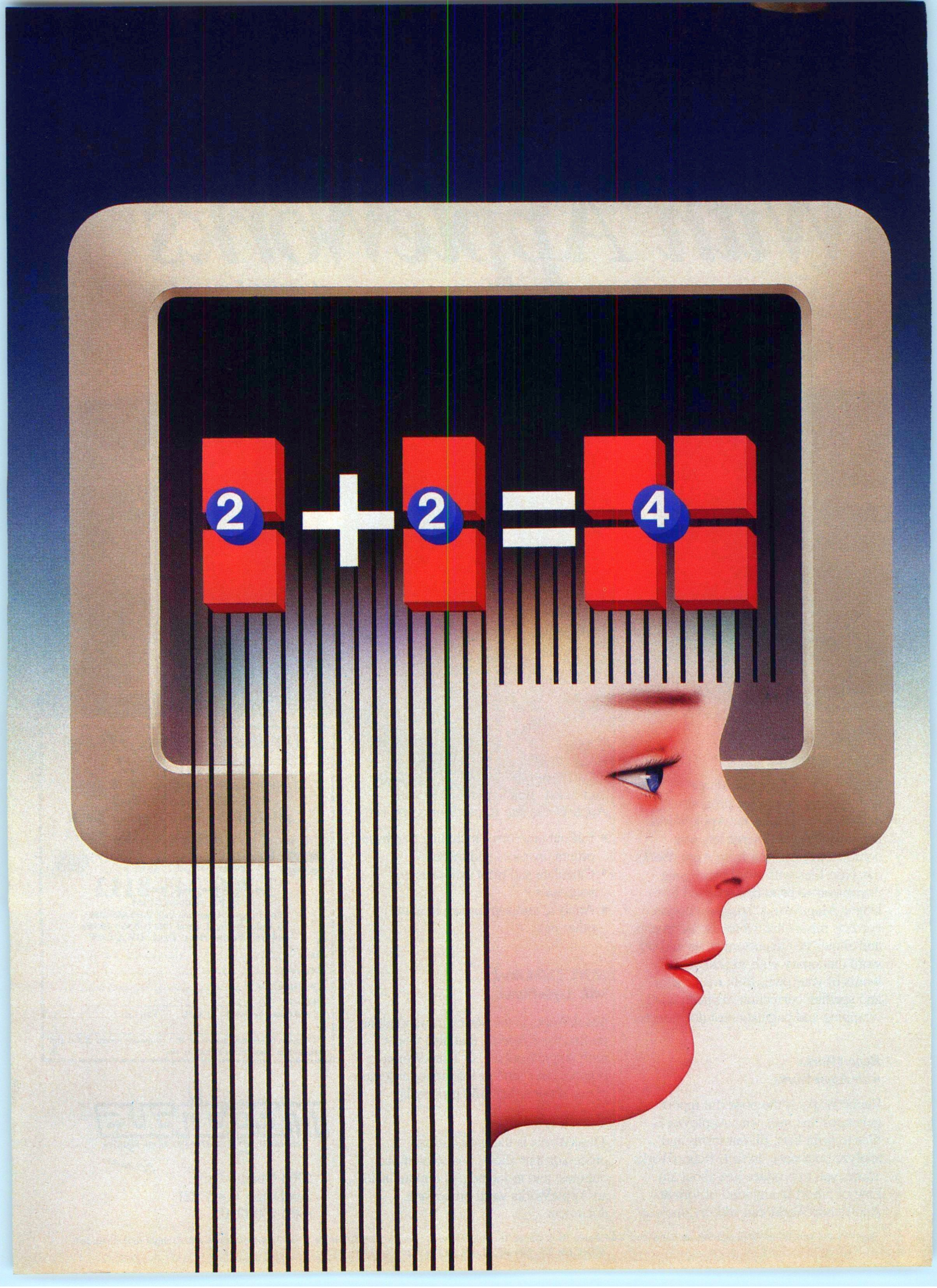

2 + 2 = 4

Computer games that help your child learn

Early MATH

Team up your Apple with the right math program, and your computer may very well become your child's favorite teacher.

Math. The very word sends chills down the spines of all too many children. Though the study of mathematics is one of the oldest branches of knowledge, it still suffers from a severe image problem. Math is often regarded as a "difficult" subject or a necessary evil, and that is really too bad, for mathematics is also a key that can open many doors. Without it, access to many careers and fields of study is severely limited. As adults, we know that mathematical skills are increasingly necessary in today's world, not only for solving problems, but also for organizing and dealing with the torrent of information we receive.

Children need many different kinds of mathematical experiences to build a strong conceptual foundation for their future studies. They need to learn, and they need to practice what they learn. Computers can be exciting and useful tools for providing some of those early experiences.

Computers have been used in mathematics education since the early 70s. The ability of a computer to store, retrieve, and present information makes it a logical addition to the teaching/learning process. With their offerings of sound, color, and animated graphics, computers can make mathematics both comprehensible and enjoyable. They can even put your child in control of his or her own learning experiences.

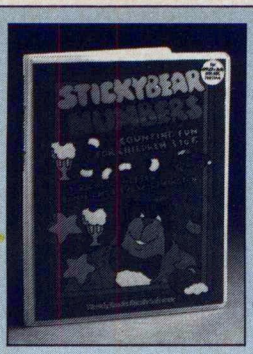
It would be misleading to claim that a computer is the answer to all of your child's mathematical needs. But, with the right software, computers can provide a partial solution and an engaging one. The problem, of course, is finding the right software.

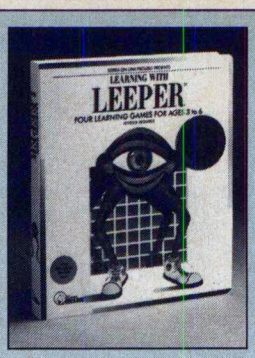
Many of us chose Apple computers because we were fully aware of the large number of educational programs available for these machines. But wealth creates its own problems. We have to choose, and the choices are many. Educational software has improved steadily in recent years, but it is still a mixed bag.

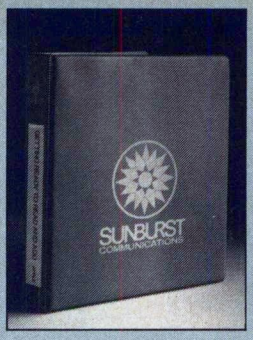
Entertaining, imaginative, and educationally sound programs crop up with satisfying regularity, but those other programs, the ones educators refer to as "swillware," are out there, too. Yet, within this wide range of possibilities, parents should be able to find worthwhile programs for children at any stage of mathematical learning. The following reviews are offered with that goal in mind.

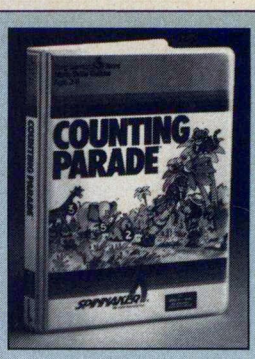
In selecting math software for young children, parents should look

ILLUSTRATION BY STANISLAW FERNANDES









PROGRAM	1 STICKYBEAR NUMBERS	2 LEARNING WITH LEEPER	3 GETTING READY TO READ AND ADD	4 COUNTING PARADE
COMPANY	Field Publications/ Weekly Reader Family Software 245 Long Hill Road Middletown, CT 06457 (203) 638-2400	Sierra On-Line P.O. Box 485 Coarsegold, CA 93614 (209) 683-6858	Sunburst Communications 39 Washington Avenue Pleasantville, NY 10570 (800) 431-1934	Spinnaker Software One Kendall Square Cambridge, MA 02139 (617) 494-1200
PRICE	$39.95	$29.95	$59 (teacher's version) $44.95 (home version)	$29.95
APPLE	II+, IIe, or IIc; 48K RAM;	II+, IIe, or IIc; 48K RAM; joystick required	II+, IIe, or IIc; 48K RAM	II+, IIe, or IIc; 48K RAM; joystick or mouse required
AGE	3–6	3–6	2½–6	3–6
SKILLS TAUGHT	Counting, number recognition, and simple addition and subtraction	Counting, number recognition, and visual discrimination	Counting, number recognition, and matching	Counting, number recognition, and grouping skills
	Circle No. 420	Circle No. 421	Circle No. 422	Circle No. 423

for the same careful construction, appealing format, and ease of use that typifies all of the better programs designed for the young. Educational programs, however, need something more. To be of real value, they should offer mathematically sound experiences in a meaningful and understandable form.

Unfortunately, what seems obvious and easily understandable to an adult is often confusing to a child. Parents have to ask themselves: "What mathematical concepts and skills does my child have right now?" All programs assume some prior exposure and learning. For example, some early-learning packages give instructions or ask questions on the screen. Others use symbols, such as +, −, or =. In these cases, the program assumes that a child knows how to read or knows the meaning of these symbols.

It would be helpful if more developers could list the concepts and skills that are needed to use a particular program on their packaging or in the accompanying literature. Unfortunately, that kind of specific information is often lacking.

Recommended age levels help, but they can provide only a rough estimation of the ages at which children can use and enjoy a particular program. Each child is different and learns at an individual pace. The best program matches the needs and abilities of the user. It fits a child's current ability level and proceeds from there—step by logical step.

1 STICKYBEAR NUMBERS

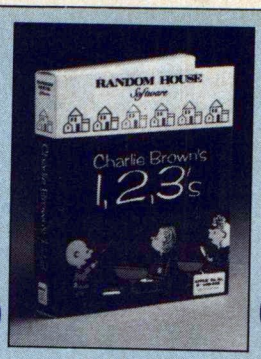
I'll begin by looking at Stickybear Numbers, a colorful introduction to counting and number recognition. This program has been around for some time. Yet, when it comes to creating a superb learning experience, Stickybear Numbers is still hard to beat.

Even the smallest child can approach this program with confidence. There is no menu to read, no tutorial, and no lengthy introduction. Pressing any number key starts the action, and the child player is in control all the way. There are no wrong answers, only a discovery process in which children are free to observe, experiment, and explore to their hearts' content.

Many counting programs force children to begin with a specific number and work their way through a predetermined sequence. Stickybear Numbers allows children to choose their own sequence. For example, if the child presses the number 6, six red cars roll into view, one by one. A large, high-resolution 6 appears in a corner of the display. Since the cars arrive separately, youngsters have plenty of time to count each car as it rolls to a stop.

Now players face a decision: should they press the 6 again or try a different number? If a player presses 6 again, all the cars disappear, and six tropical fish swim into view.

By this point in the game, most children are thoroughly intrigued. They'll press the same key again and again. Each time, they are rewarded with an entirely new set of six objects. The variety seems endless. Sailboats, sodas, and snowmen appear, as do trains, planes, and planets—all helping to illustrate the concept that num-

5	6	7	8
			
EARLY GAMES FOR YOUNG CHILDREN	**CHARLIE BROWN'S 1,2,3'S**	**LET'S GO FISHING**	**MICROADDITION/ MICROSUBTRACTION**
Springboard Software, Inc. 7808 Creekridge Circle Minneapolis, MN 55435 (612) 944-3915	Random House Software 201 East 50th Street New York, NY 10022 (800) 638-6460 In MD (800) 492-0782	Learning Technologies, Inc. 4255 LBJ Freeway, Suite 131 Dallas, TX 75244 (214) 991-4958	Hayden Software Div. of Spinnaker Software One Kendall Square Cambridge, MA 02139 (617) 494-1200
$35	$39.95	$19.95	$19.95 each
II, II+, IIe, or IIc	II+, IIe, or IIc; 64K RAM	II, II+, IIe, or IIc; 48K RAM	II+ or IIe; 48K RAM
2½–6	3–7	4–8	4–10
Counting, number recognition, visual discrimination, matching, addition, and subtraction	Counting and number recognition	Counting, number recognition, and visual discrimination	Counting, number recognition, and addition or subtraction
Circle No. 424	Circle No. 425	Circle No. 426	Circle No. 427

ber is independent of shape, size, color, or movement.

Eventually, as they continue to explore, children will discover the space bar. Perhaps they've been watching four penguins waddle across the screen. Then, if they press the space bar, one penguin disappears! The numeral 4 changes to 3, showing that only three penguins are left. If the player presses the space bar again, another penguin disappears, and so on until no penguins are left and only a big 0 remains on the screen. It would be difficult to imagine a clearer and better presentation of what subtraction is all about.

But there is more to come. That zero is still on display, and it's tempting to try the space bar again. Voila! One penguin appears, along with the numeral 1. Up and down, from 0 to 9 and back again, fully entertaining and illustrated all the way, Stickybear Numbers makes learning fun.

Stickybear Numbers comes packaged with stickers, a full-color poster, and a hardcover book. Suggestions for additional learning fun are included in the excellent parents' guide.

2 LEARNING WITH LEEPER

Learning with Leeper is a collection of award-winning games that help children develop basic skills. I will limit my discussion to Balloon Pop and Dog Count, since they focus on early number skills.

Balloon Pop is a matching game with six levels of difficulty. As the game begins, a display shape appears at the upper right of the screen. More shapes appear on the bottom of the screen. As a colorful hot-air balloon floats into view, the child uses a joystick to maneuver the balloon over one of the shapes below. Then the player presses the joystick's fire button to "pick up" the shape. The child then moves that shape over to the display to see if the two match. If the shapes match, a tune plays and the game begins again. If the shapes do not match, the child simply tries again.

This is a fun game and one that encourages sharp attention to detail as the figures become increasingly complex. In higher levels, differences between figures are so slight that a sophisticated system of elimination is required to achieve a correct match. Balloon Pop can be a valuable precursor to letter- and number-recognition skills since it prepares youngsters for the visual discrimination those skills require.

Dog Count encourages toddlers to practice number recognition and counting skills in the guise of a lively dog-feeding game. Hungry dogs sit on the left on the screen patiently awaiting their dinner. An empty bowl rests in front of each dog. On the right are rows of bones, each preceded by a number. Using the joystick, children move Leeper up the rows of bones until they reach the row that has as many bones as there are bowls. They make a choice and press the fire button. A bone appears in each dog's dish, and the dogs wag their tail in appreciation.

Error handling is excellent. If the player chooses a row that contains too many bones, the dogs are still fed, but extra bowls appear to hold the leftover bones. If too few have been chosen, some of the dogs are fed, and

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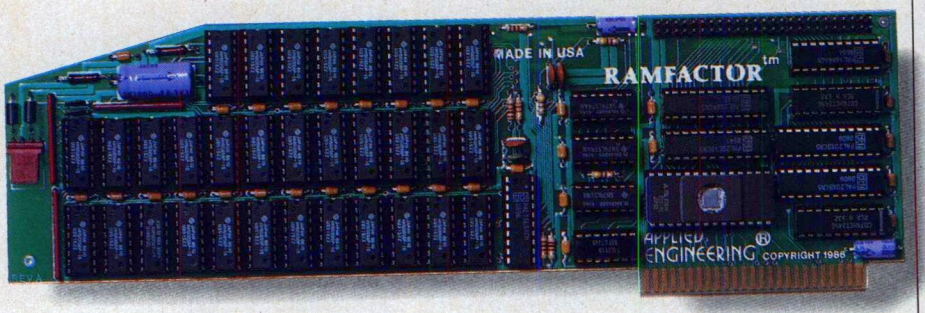

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Buying Software for Preschoolers

Children's software choices are often determined by how much they like the picture on the box. But, as parents know, attractive packaging doesn't guarantee anything. The real value of any program is determined by what's inside the box. Since choices do have to be made, here are some guidelines to make the selection process easier.

Ease of Use: Can your child use the program easily, with a minimum of adult intervention? For the toddler, programs should be so easy to use that they are virtually self-explanatory. Multikey input, written explanations, and on-screen instructions are fine for older children, but they can prove frustrating for a preschooler. A program that is easy to use invites a child in and builds confidence from the beginning.

Appeal: A program may be bursting with educational value but, unless it is used, that disk might as well be blank. An appealing format commands interest and makes children want to spend time with the program.

Clarity: Concepts should be presented logically and clearly, with a minimum of on-screen clutter. "Busy" graphics may look lively to adults, but young children often find them distracting and even confusing.

Control: Can your child control the program, or does the program control the child? Good software allows children to be in charge and encourages individual decisions.

Variety: Variety keeps interest high. If a program follows one rigidly determined sequence, without any possibility of variation, its appeal is likely to wear thin. Children like to explore and test "what if" hypotheses. Good programs anticipate this desire and plan accordingly.

Challenge: Clever graphics, intriguing sounds, and child-controlled action increase motivation, but the best programs also offer challenge in just the right proportions. Too much challenge is frustrating and can make a child feel incompetent. Too little leads to boredom. Confidence comes from dealing with material that is somewhat familiar—with just that added dash of challenge to keep a child reaching out for more.

Speed: Programs that move too quickly are frustrating, especially for children who are new to computing. On the other hand, programs that poke along will try the patience of any child. Long waiting periods while a program loads or screens that sit around too long after the child has made a correct response will soon have that child looking around for something better to do.

Educational Objectives: Does the program do what it promises to do? Does it present new information or reinforce existing skills? Both objectives are valid, but practice should come only after a child understands basic concepts.

Finally, does the program's format support its educational goals, or does it detract from them? If a program disguises its educational content too well, the result can be a fascinating game, but its educational value may be lessened considerably.

Error Handling: How are correct answers rewarded: Preschoolers need positive learning experiences, and they derive a great deal of pleasure from mastering a program. Extrinsic rewards, such as smiling faces or musical fanfares, can be pleasing, as long as they are not overdone. Programs that are intolerant of normal exploration, that reward honest effort with disagreeable noises or discouraging feedback, should be avoided.

the remaining dogs face empty bowls. The feedback is visual and dramatic. What better way to teach concepts such as "too many" or "not enough"?

This program is ideal for children who are just learning to count. The format is clear and presents both one-to-one correspondence and numeral recognition. Learning with Leeper is bright and entertaining, and it offers sufficient variety to keep children happily absorbed.

3 GETTING READY TO READ AND ADD

Getting Ready to Read and Add is a carefully designed program that features, along with four prereading activities, two math games that can help children with matching, number recognition, and simple counting. The menu does require reading ability but, once players have selected a game, they can use it easily.

Moon Math presents two hills with a tower in between. A number appears over one hill. One by one, other numbers appear over the second hill. When the two numbers rising over both hills match, the player simply presses any key, and the tower emits a laser beam that zaps both numerals. Children who are still a bit shaky in recognizing numerals will find this activity helpful. Frequently, children reverse numerals or confuse similar numerals, such as 6 and 9. Moon Math should be an effective remedy for these difficulties.

Number Check also involves matching, but here the player must match a numeral to the number of squares on a die. Counting is required, but the pace is well suited to the slow counting skills of a beginner.

While Getting Ready to Read and Add may lack some of the pizzazz of other early-learning programs, its carefully structured format makes it a good choice for parents who are serious about teaching number skills in a logical, sequential fashion. Ease of use is commendable, and the documentation is excellent. Best yet, the Change option allows parents to tailor each program to their child's particular needs.

4 COUNTING PARADE

Counting Parade is designed for children ages 3 to 6. Excellent, full-color graphics make this program a real eye-catcher. Though easy to use and entertaining, Counting Parade is best for children who are already able to match objects to a corresponding numeral.

Two levels of difficulty are offered. In level 1, a menu of animals appears. The player chooses animals for the parade with the help of the joystick or mouse. As soon as the player has chosen the animals, the game screen appears.

A numeral, from 1 to 9, appears at the top of the screen. Below, green plants dot the landscape. The number of plants matches the number at the top. Music plays and animals march,

left to right, across the bottom of the screen. The child's task is to pick up an animal (giraffe, bunny, tiger, and so on) and place it on one of the plants. The player presses a button on the joystick or mouse to pick up and release each animal. A colorful toucan counts along as each animal is deposited. Once the required number has been reached, the toucan dances happily, and a new parade begins.

Level 2 is similar, but here the animals appear in groups, separated by a butterfly. The player must choose the group that matches a number at the top of the screen.

Counting Parade has a lot of visual appeal, and the pace is just right for preschoolers. The only disappointment is that so few levels are available. Once children have mastered the program, it provides no further challenge. Yet it can provide the extra practice youngsters need when their counting skills are new.

5 EARLY GAMES FOR YOUNG CHILDREN

Early Games features nine learning activities designed to teach math and language skills to children 2½ to 6 years old. This program is easy to use and offers the variety a program needs to appeal to children at varying levels of expertise.

Compare Shapes offers a simple matching activity. Several shapes appear on the screen, and the child must choose the one that is different from all the rest.

Match Numbers encourages players to learn the position of each number on the keyboard while attempting to match the numeral shown on the screen. Even children too young to read numerals can participate in this activity. For them, it becomes another matching game. If parents join in and say the names of numerals as they appear, numeral recognition can then be added to the list of a child's accomplishments.

Count presents a series of blocks. The task is to count the blocks and press the corresponding number key. An easy task—if a youngster can count and realize that three blocks can also be represented by the numeral 3. As soon as the player presses the correct key, that number appears on the screen. An incorrect response causes the blocks to change color, and the child is encouraged to try again.

Add presents simple addition with blocks. Once children understand that the object is to combine blocks and what the symbols + and = mean, they should be able to go it alone. Beginners will find the blocks a distinct help. They can count all the blocks in order to make sure that 2 + 1 does indeed add up to 3.

Subtract has the same format as the addition game, but the concept presented is, of course, subtraction. Subtraction is somewhat more difficult than addition for preschoolers, but with a bit of help, most children will do just fine.

A lot of care and thought has gone into Early Games. The documentation is clear and advises parents to keep in mind that the suggested age range is not a rigid timetable. Children develop at different rates and, with the right kind of assistance, they'll enjoy testing their new skills.

6 CHARLIE BROWN'S 1,2,3'S

It's difficult to imagine a child who won't be enchanted by the antics of Charlie Brown and his friends. The graphics for this program are excellent, and lively animation adds to the fun. Youngsters who play-tested this

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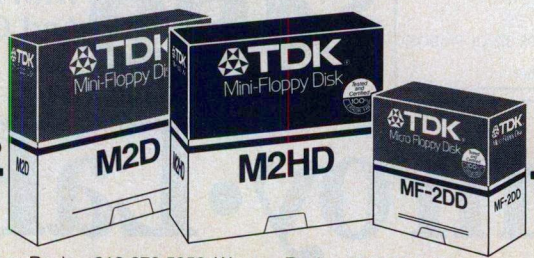

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CIRCLE 173 ON READER SERVICE CARD

program found it both funny and enjoyable.

The software presents three activities: number recognition, counting, and a game that combines both skills. The games themselves are clear and easy to use. The trick is in getting to them. For, although the games are perfectly suited to the abilities of young children, the menu is complex enough to challenge the ingenuity of their parents.

Finding the menu is the first hurdle. Where is it? To find out, parents will have to read the accompanying booklet. Once they do so, they'll find that they must type the letter *O* when the title screen appears; otherwise, no menu shows. Getting back to the menu once a game has been completed isn't easy either. In fact, you can't do it without rebooting the entire program.

Yet, that objection aside, Charlie Brown's 1,2,3's does enable children to practice basic skills in an undeniably appealing manner. You can turn sound effects on or off by pressing Control-Z—a definite plus for many parents. As for the games, a simple press of the space bar, Return key, or one of the number keys is all that is really required for play.

Children learn numbers with the help of a large, easy-to-read number screen. After selecting a number, the child presses Return, and the number screen disappears. The chosen number now appears above a like number of objects—five pumpkins, for example. All children have to do is find the corresponding number on the keyboard and press it. If they've chosen the correct number, Charlie Brown or one of his friends appears in a short, animated sequence.

The counting activity is a little different. The player selects a number, and that number appears on the screen, but the objects are missing. They appear, one by one, as the child presses the space bar—a nice, tactile approach to counting. If the task is done correctly, the Peanuts gang appears and rewards the player with a short "skit."

The final game combines elements from the previous games. Again, the player selects a number and then presses the space bar to make a corresponding number of objects appear. But to make the Peanuts gang perform, the player must find the total number of objects and type in that number. After the child presses the Return key, the action begins.

Charlie Brown's 1,2,3's is educationally sound and offers a clear presentation of numbers and counting. The program is a bit slow, but the visual appeal is so strong that it easily keeps children entertained.

7 LET'S GO FISHING

Let's Go Fishing provides counting and adding practice for children of 4 to 8. That's an interesting age range, since it spans two very different developmental stages. It's difficult to design activities that are within a four-year-old's grasp without boring older children. Challenging an eight-year-old, on the other hand, may mean leaving younger children behind. The only answer is to offer games at different levels of difficulty, and this is just what the people at Panda have done. Let's Go Fishing, therefore, actually consists of two games, Let's Go Fishing and Make a Necklace. Each game requires different kinds of skills.

In Let's Go Fishing, a jolly cat sits on a floating log and holds a fishing pole. Children can modify the length

7 MEG IIe / 640K IIc

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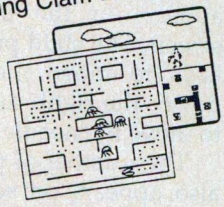

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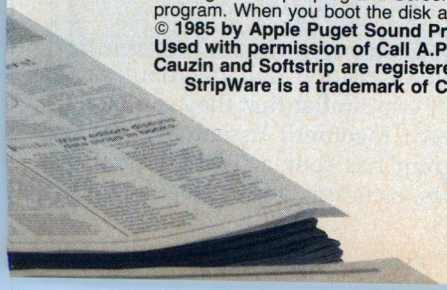

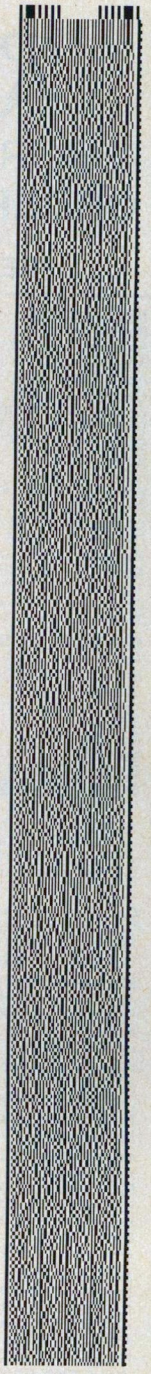

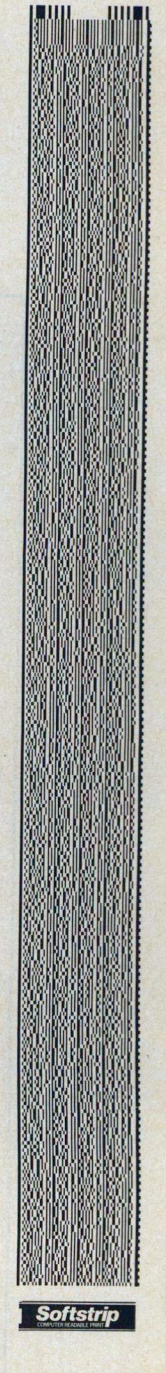

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CIRCLE 120 ON READER SERVICE CARD

of the pole by pressing the right- and left-arrow keys. They can raise and lower the fishing line by pressing the A and Z keys. It takes a while for children to keep these moves straight, but, having mastered which keys do what, young players are more than ready for some fishing fun.

Colorful fish swim below the log. The number of fish to be caught appears at the top of the screen—as part of a written statement. The statement might read, "Catch 6 fish." But there are several kinds of fish. Which ones does the cat want? The answer resides in the lower left of the screen. The type of fish to be caught appears in a box, and children must use their visual-discrimination skills, as well as a good bit of dexterity, to catch only those fish that match the example.

Can four-year-olds accomplish all this? Surprisingly, they can. Younger children respond to the challenge and really try their best to help the cat fill his quota of fish. Older children have a much easier time and seem to enjoy all the action.

The fact that four-, five-, and six-year-olds are so attracted to this game indicates that its designers have struck a resonant chord. But some judicious input from a learning specialist could have made this game much better. For example, once a fish has been caught, it appears at the bottom of the screen, separated from the display fish by only a thin line. Most youngsters have a hard time separating the display fish from the ones they've caught because, if they catch two fish, it looks as though they actually have three.

Also, a correct response is indicated by a simple check mark; an incorrect response earns an X. That's indicative of a kind of marking system used in schools, and it's one that many educators now regard with disfavor because it gives children no useful information about what it was that they did right or wrong.

Make a Necklace is a game that requires a good deal of manual dexterity and speed. It has the look and feel of an arcade game and is definitely designed with older children in mind.

The screen displays a great many dots, or "pearls." A small "needle" appears in the upper left of the screen. The child presses the A and Z keys to move the needle up and down, the right- and left-arrow keys to move the needle to the right or left.

The number of pearls to be strung also appears on screen. The action, once the needle is moving, is fast. The player can't stop the needle, and children must be agile indeed to keep the needle from touching the sides of the screen. Once a side is touched, the entire screen disappears, and the game is over. A new screen with a new number takes its place.

Older children love the action, but the educational value of the game may get lost in the players' panic to avoid bumping into walls. Because of this, Make a Necklace is less effective than Let's Go Fishing, but conceivably it can increase adding speed for youngsters who have their basic skills down pat, and it is definitely the kind of game that keeps older children coming back for more.

8 MICROADDITION/ MICROSUBTRACTION

microAddition and microSubtraction are so similar that they can be reviewed together. Essentially, each program has four activities: number values, counting, adding (or subtract-

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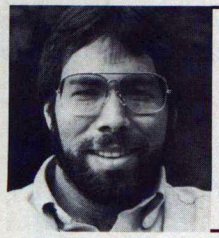

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But perhaps the best news is that Z-RAM II has a built-in high speed Z-80B microprocessor that allows you to run CP/M programs. Which means you now have access to the single largest body of software in existence, including popular packages like WordStar, dBase II, Turbo PASCAL and Microsoft BASIC.

Z-RAM II is compatible with all IIc software and hardware, installs easily in just ten minutes with only a screwdriver, is available with memory upgrades up to 1 MEG that can be user-installed at any time. Z-RAM II is easily handled by the IIc power supply with our patent pending power saving design. In fact, a 1 megabyte Z-RAM II draws less power than a 512K Z-RAM.

For fast response.

Z-RAM II comes complete with simple instructions, RAM disk software, Z-80 operating system, CP/M manual, and a five-year "hassle free" warranty.

Make your Apple — and AppleWorks — work better. With 256K Z-RAM II ($329); 512K ($389); 768K ($449); 1 MEG ($599).

If you want to run CP/M software, but don't need more memory, we suggest our Z-80c card. The Z-80c has no memory expansion ports and is priced at only $159.

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ing) balloons, and adding (or subtracting) numbers.

Number Values lets a child choose a number between 1 and 9. In microAddition, once the child has chosen a number, apples drop from a tree onto the ground, one by one. The program "counts" the apples by having a number appear inside each fallen apple. In microSubtraction, the child chooses the number of eggs to be hatched. As each egg hatches, a bird flies up into a tree. It is "counted" when a number appears next to it.

Counting presents an already selected group of apples or birds. The child must count the number of objects on the screen and type in that number. Three tries are permitted. After a third unsuccessful attempt, the computer displays the answer.

In Adding Balloons, the player adds a group of balloons to a second group of balloons—a jump above the previous activities, since it involves number input, understanding of + and − symbols, and the ability to add groups of objects to each other. Subtracting Balloons is a similar game, but this time the child must subtract one group of balloons from another group of balloons, calculate the difference, and type in the answer.

The best math program matches the needs and abilities of the user.

Adding Numbers and Subtracting Numbers offers two choices: Quiz or Calculator mode. If the player selects the Quiz mode, a numerical problem appears, and the child types in the correct answer. Typing C brings up the Calculator mode. Children enter their own problems, and the computer acts as a calculator, supplying the correct answer.

These are interesting programs. They are simple and, at least at the easier levels, understandable. It would be hard to find fault with their presentation of mathematical concepts. Yet, both programs could be more appealing if the graphics were better and offered more variety. Children get bored with seeing the same balloons over and over again. But, used judiciously and in combination with other, more entertaining programs, microAddition and microSubtraction can give a home-centered math program the conceptual basis it needs. The price is certainly right.

Making the Choice

The question of which software packages are right for a child's needs and interests must ultimately be answered by parents. Only they can decide what their child needs in the way of information and reinforcement. As we have seen, some trade-offs are involved. Some programs, although they are extremely sound, lack entertainment value. Others are impressively entertaining, but are weaker in their presentation of basic information. Some are limited by a lack of variety. Still others offer so much variety and so many skill levels that a youngster will be able to use only parts of the program at first. Although many of these programs can be used by a child working alone, others require varying degrees of parental supervision. Parents know their children best and must decide which skills and which format seem best suited to their needs. ✚

Ute Elisabeth Van Nuys is a free-lance writer and computer-education consultant and has taught computer classes in the public schools.

POWER PRINT™ lets your printer do what it was designed to do.

Custom Printer Typefaces!

POWER PRINT software lets you "download" a second typestyle into your printer's memory. Now you can alternate between your printer's standard font and a custom font with special characters and symbols:

COUNT: ABCDabcd6789*&?
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OUTLINE: XYZ OLD ENGLISH

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Many custom printer-fonts are included on the Power Print disk. An easy-to-use Font Editor lets you quickly redraw any of the characters in our fonts. Or you can design your own fonts and characters from scratch.

Your printer's special effects (condensed type, expanded, bold, etc.) will work with both your standard and custom fonts.

Mix Graphics and Text

Power Print turns your printer into a creative tool. For example, you may design up to 96 custom printer-characters that combine to print a small illustration like a logo or your signature. You may then include this illustration as part of your regular word processor printouts.

The images shown here were typed with AppleWorks (along with regular text) and printed on an ImageWriter printer. Other software and printers work equally well.

Honestly,
A. Lincoln
Uncle Abe

AppleWorks Compatible

In fact, Power Print is everything-compatible. After loading a custom font into your printer (in under 2 seconds), just boot AppleWorks, AppleWriter, ProDOS, DOS 3.3—or absolutely any Apple program or software that you want—and custom printing is yours.

Full Speed Ahead!

Unlike other printer-font software you may have used, Power Print won't slow your printer down—not even a microsecond.

These Printers and More

Power Print works on most printers with full-font downloading capabilities, including—

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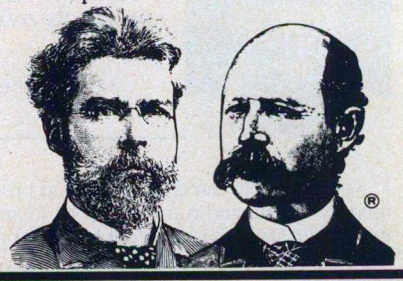
- ☐ EPSON (FX, JX and EX Series)
- ☐ OKIDATA (92, 93, 192, 193)
- ☐ PANASONIC (1092, 1093)
- ☐ STAR (Delta, Gemini, Radix, SD, SG, SR)
- ☐ and many others

$39.95 Friendly and Unprotected

Power Print works with any Apple IIe, IIc or 64K II+. Like all Beagle software since 1980, disk backups can be made without hassle.



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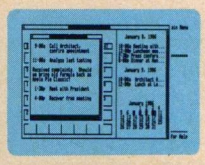

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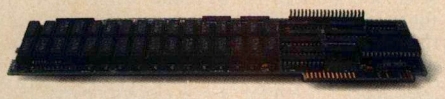

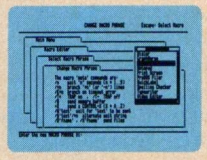

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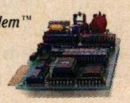

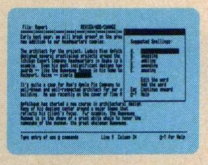

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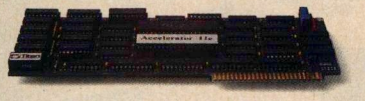

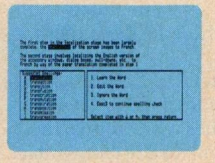

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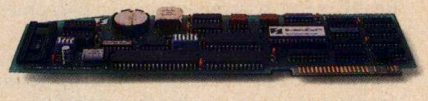

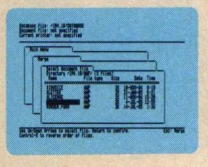

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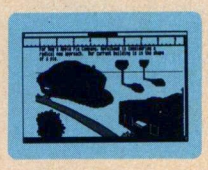

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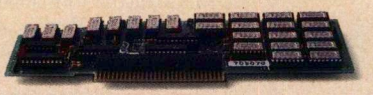

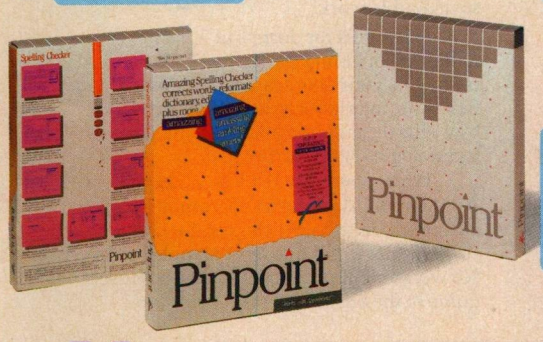

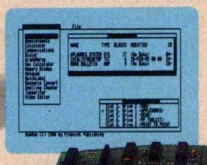

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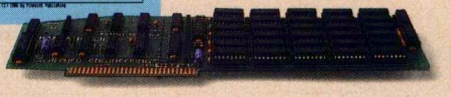

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For example, PINPOINT's line of Desktop Accessories that "pop-up" from inside AppleWorks™ without disturbing your work. So convenient, you'll think they're actually built right in. And in a way, they are.

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Desktop Accessories are great. But sometimes they just can't do everything you want. That's why Pinpoint offers three more-powerful stand-alone solutions.

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Δ Exclusive Extended Xmodem Protocol (EXP) with CRC-16 transmits/receives multiple files in batches with original file names, extensions, and file attributes intact. Ready to run, without misspelled file names or tiresome file conversions.

Δ 14 powerful macros commands automate logon sequences; system operating commands automatically upload and download electronic mail or program files. Pattern recognition feature even makes decisions based on what it "sees" coming across the screen.

Δ Built-in text editor, or send AWP or text files directly.

Δ Simultaneous formatted printing while online. Instant "Print Screen" prints anything and everything displayed on your screen.

Δ Impressive file handling utilities manage files, subdirectories and paths without typing, even while online!

Δ Install PINPOINT Desktop Accessories for even greater versatility, or use RunRun and Toolkit to add valuable desktop accessories anytime.

Δ Smart utilities strip line feeds from downloaded files, and convert TXT to AWP files; plus 8 indispensable file type conversions save double work!

Δ Support for dozens of modems, including the newest 2400 Baud units, gets your new system working right the first time. Interface cards include old stand-bys, plus the emerging Apple II interface technologies of tomorrow.

Written by Gary B. Little, an expert Apple II and Macintosh programmer, and author of countless articles for *A+*, *Call APPLE*, *Nibble* and five recent Apple books. No wonder Point-to-Point has the best user guide in the business.

Do Two Things At Once

RunRun™ Desktop Manager $49 The perfect manager for UniDisk™ 3.5, RAM drives and hard disks. Runs multiple accessories at one time (for example, run Notepad/GraphMerge or Calendar/Dialer).

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New Version 1.3! Improved communications, more modems, printers and interfaces supported.

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Appointment Calendar Print schedules to take with you. MonthView, DayView and Summary displays.

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Communications Window Instant modem communications from AppleWorks desktop with simplified auto logon macros; no complicated control codes required. Downloads (records) files in AppleWorks' AWP file format.

Telephone Dialer Finds phone numbers anywhere on ANY screen. No phone directory or databases to re-enter.

GraphMerge Paste up to 16 single or double hi-res graphic images, mix & match, anywhere in AppleWorks documents.

Notepad Powerful baby word processor produces AppleWorks files. Use Notepad files inside AppleWorks documents, or with GraphMerge.

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Typewriter Ideal for short letters, forms, file folder labels, and name badges. Compose, edit, then print, just like an IBM Memory Writer typewriter.

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"I'm impressed with InfoMerge's capabilities; indeed it made me realize that it could be used as a database report writer -- a feature that's more attractive to me than its identity as a form-letter generator. It lets me format database reports practically any way I want to."

Ralph Brown, Marblehead, MA

InfoMerge™ $79 Integrated Apple-Works database reporting and mail merge program with all the right tools for most any printing job.

Δ Display database contents before merge, or display merged records on-screen -- fully formatted with merged categories highlighted -- before printing!

Δ Direct printed output with direct AppleWorks database file manipulation without bothersome file conversions. Includes category selection criteria and exclusive automatic AWP/ADB file linking.

Δ Multi-column forms with text columns aligned properly. Also merges paragraphs of text, not just single lines.

Δ Calculated fields in the merged document with floating point math, eliminates redundant calculated categories cluttering up your databases!

Δ Keyboard variables permitted, both "Local" (different for each record) and "Global" (same for all records).

Δ Automatic or manual record merging, including record level selective print, don't print, and multi-print (to 99 copies) features.

Δ Remembers last-used file names, even saves current state of the job you're printing, so you can restore and resume printing right where you left off!

Δ Install PINPOINT Desktop Accessories for even greater versatility, or use RunRun and Toolkit to add timely new features and valuable desktop accessories anytime.

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SPELLER for quick convenience, DOCUMENT for longer documents. The amazing 61,000 word dictionary is integrated with unlimited word capacity personal dictionaries so there's never a need to check documents twice!

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DOCUMENT CHECKER specializes in checking larger documents. It uses more memory to check 30 words per second! Same outstanding check, suggest, correct and reformat features. Quickly switch from AppleWorks to DOCUMENT CHECKER and back with RAM Enhancement Kit or RunRun's RAM Switcher.

❑ *Registered SPELLING CHECKER owners can get DOCUMENT CHECKER for $30 directly from Pinpoint.*

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Δ Valuable on-line reference: nutrition facts, food selection and storage, and ingredient substitution suggestions.

Δ Lightning fast fourth-generation, bit-mapped database design finds plurals, truncations, multi-key relations, overlooks request errors, and otherwise works hard so you don't have to.

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Ext. **613** ❑ **$129 POINT-TO-POINT Telecommunications**. $49 RunRun, FREE.
❑ *Or, at your option, receive a $50 trade-in credit for your old communications software when you order directly from Pinpoint.*

Ext. **618** ❑ **$89 PINPOINT**

Ext. **616** ❑ **$79 INFOMERGE**. $49 Instant Business Letters from Q-Mar, FREE.

Ext. **619** ❑ **$99 Spelling Checker / Document Checker** two-package set*.

Ext. **619** ❑ **$69 Spelling Checker***

Ext. **619** ❑ **$69 Document Checker**
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SCIENCE Lab

with software and kits that let you simulate a range of experiments.

Since their invention, computers have aided scientists and engineers in gathering and processing data. Computers also allow the scientific community to create and investigate the properties of complex phenomena through the use of computer models. Such models can simulate the behavior of atoms or the weather on our planet. Today, scientists of all ages can use the Apple II family to explore, analyze, and study the universe.

Simulating the Lab Environment

The Apple II can simulate a science laboratory without the mess or potential hazards. Computer models can be realistic, or they can simulate experiments that cannot be done with today's technology. As an individual, using your Apple II, you can do experiments that might otherwise require teams of scientists, and you can collapse or expand the window of time to fit your own schedule.

Simulations let you control one or more of the variables in an experiment. As you enter values and observe the results, you can discover or confirm basic scientific principles.

Chemistry simulations for the Apple II, such as those from High Technology and COMPress (see figures 1 and 2), let you perform tests on a variety of chemicals as they react with each other. You can discover Boyle's and Charles' gas laws as you observe the effects of pressure and temperature changes on gaseous molecules represented by moving dots on the screen. Other experiments allow repeated reactions between acids and bases in a short period of time. Experimental error is often built in, and these simulations often provide online help with necessary calculations.

In biology simulations, your Apple II computer can help you study the behavior of caged creatures as you manipulate their environments with Discover: A Science Experiment from Sunburst. Software from Merlan Scientific and Microcomputer Workshops lets you do genetics experiments in a few minutes that would normally take generations. Operation Frog from Scholastic (see figure 3) and The Body Transparent from DesignWare promote anatomical awareness without making you sacrifice a frog or handle a cadaver.

Nutritional simulations are also popular. With packages such as Nutritionist from N-Squared, you can compare what you want to eat with what your body needs.

The tools necessary for many physics experiments are often expensive and difficult to operate. High Technology and Cambridge Development Labs provide physics simulations in which you can measure projectiles moving through space and charged particles moving through electrical or magnetic fields. With the help of your Apple II, you can inexpensively simulate initial conditions of the experiment and let the computer tell you the results.

An earth-science simulations called Volcanoes from Earthware Computer Services allows you to predict the probability of eruptions by mythical volcanoes by studying data from a variety of instruments that you place in the field (see figure 4). The Galactic Prospector from Walt Disney Personal Computer Software gives you access to data gathered from satellites and core

ILLUSTRATION BY STANISLAW FERNANDES

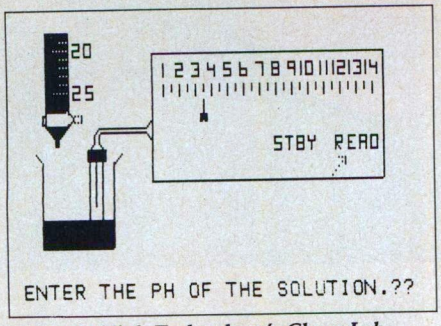

Figure 1: High Technology's Chem Lab Simulations for beginning scientists

drillings as you search for oil, gas, and various minerals.

For science students, computer simulations are no substitute for real experimentation. They do, however, help promote the understanding of scientific concepts and help in the development of logical thought and problem-solving abilities. Computer simulations can also help science students develop the level of familiarity with computers they'll need when the time comes to use computers as tools in real experiments.

With inexpensive attachments, the Apple II can receive data directly from the outside world. If you wanted to measure light, for example, you could use a detector that converted light energy into a proportional quantity of electrical current known as an analog signal, and an analog-to-digital convertor interface to convert the electronic signals from the digital data detector into your Apple. The final ingredient would be software that could make sense out of the data signals that arrived inside your Apple.

Products that let you carry out your own experiments are becoming more abundant, less expensive, and of higher quality. The outstanding example of this type of product is the Science Tool Kit from Brøderbund. It comes with light and temperature probes and an interface box that connects them to the Apple game port. The box has two

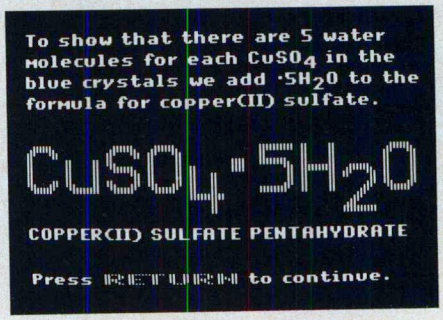

Figure 2: A screen display from COMPress' Introduction to General Chemistry series

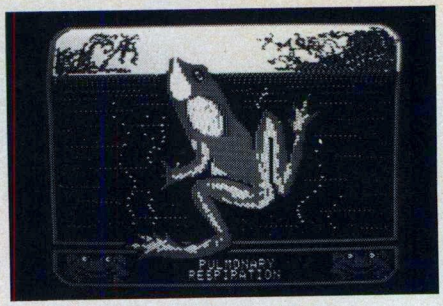

Figure 3: Operation Frog, a biology simulation program from Scholastic

ports for receiving analog data (such as the range of temperatures and light intensities the probes provide). The Tool Kit also provides two other ports that can collect digital, or on/off, data for future use (see figure 5).

The software that comes in the package lets you store, print, or graph data after you've collected it. The manual contains several experiments you can do, but nothing's stopping you from dreaming up your own. At $49.95, the Science Tool Kit is a big winner for the price.

Brøderbund is not alone, however, in the field of experimental interfaces for the Apple II. HRM Software produces more sophisticated science kits in the $300 price range that allow you

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- The entire system is on one standard size plug in card that fits neatly inside the Apple.
- System includes sample programs on disk.

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A/D SPECIFICATIONS

- 0.3% accuracy
- On-board memory
- Fast conversion (.078 MS per channel)
- A/D process totally transparent to Apple (looks like memory)
- User programmable input ranges are 0 to 10 volts, 0 to 5, −5 to +5, −2.5 to +2.5, −5 to 0, −10 to 0.

The A/D process takes place on a continuous, channel sequencing basis. Data is automatically transferred to its proper location in the on-board RAM. No A/D converter could be easier to use.

D/A SPECIFICATIONS

- 0.3% accuracy
- On-board memory
- On-board output buffer amps can drive 5 MA
- D/A process is totally transparent to the Apple (just poke the data)
- Fast conversion (.003 MS per channel)
- User programmable output ranges are 0 to 5 volts and 0 to 10 volts

The D/A section contains 8 digital to analog converters, with output buffer amplifiers and all interface logic on a single card. On-card latches are provided for each of the eight D/A converters. No D/A converter could be easier to use. The on-board amplifiers are laser-trimmed during manufacture, thereby eliminating any requirement for off-set nulling.

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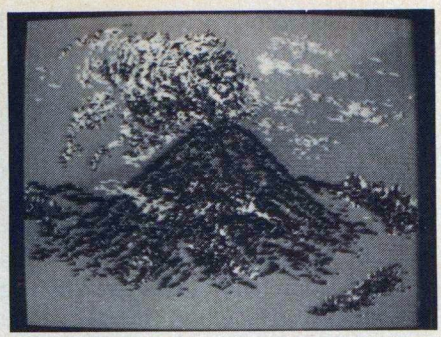

Figure 4: Volcanoes, an earth-science simulation for predicting volcanic eruptions

to measure light and temperature and many other parameters, such as heartbeat, respiration, humidity, pH, and voltage. The package includes all the necessary detectors, interfaces, software, and experimental procedures (see figure 6).

If you are looking for even more sophisticated equipment, check the latest *Central Scientific Catalog*. It features the Vela-Plus, an Apple-compatible microcomputer that can collect up to 1023 data items from four detectors at the same time. The data is stored in EPROM and transferred to the Apple at the end of the experiment. Other, more sensitive, detectors for this unit can be bought separately. Sensors for detecting magnetic fields, barometric pressure, oxygen, and evenly spaced marks on a paper tape can be purchased in addition to the sensors already mentioned. Though a complete system can cost more than $1000, Vela-Plus is ideal for school use.

Many products that offer excellent methods for developing the young scientific mind may not even look like science software. Products such as Factory and Super Factory from Sunburst and Pinball Construction Set from Electronic Arts promote logical thinking, spatial recognition, and creativity, which are all necessary scientific tools. Rocky's Boots and Robot Odyssey from the Learning Company are similar products that teach about electronic components as they entertain and stimulate. Many reading adventure games, such as Mickey's Space Adventure from Sierra On-Line, contain scientific content and promote these same skills.

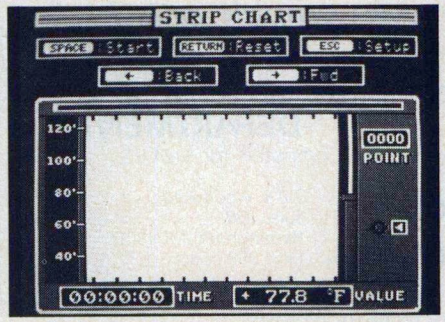

Figure 5: Brøderbund's Science Tool Kit lets users carry out their own experiments.

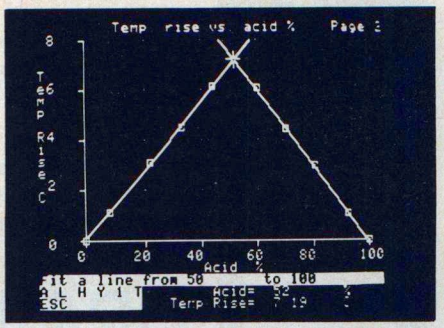

Figure 6: HRM's science kits come with detectors for measuring a range of parameters, including temperature and pH.

Science students and teachers are quick to adapt general-purpose programs for their own use. A spreadsheet makes a great tool for streamlining the calculations that often follow the data-collection process, for instance. A word-processing program is ideal for writing and revising lab reports. We have also seen science-oriented newsletters and posters created with

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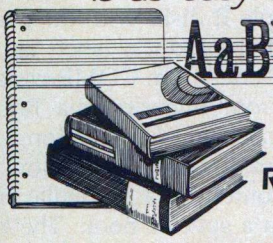

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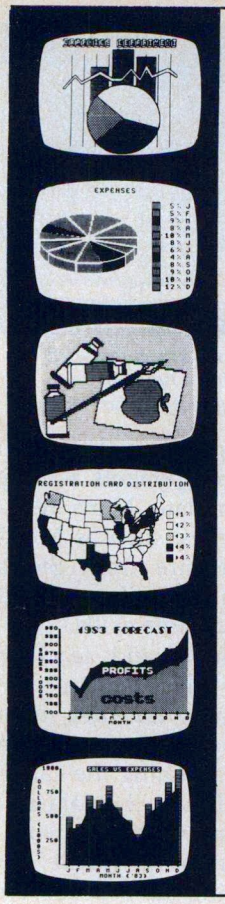

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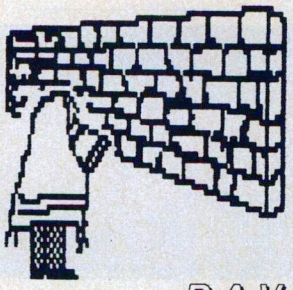

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the Newsroom by Springboard and the Print Shop series by Brøderbund. Other graphics tools, such as Brøderbund's Dazzle Draw, can be used to create interesting diagrams.

A database-management program provides a convenient way to organize and sift through mounds of scientific information. To facilitate this process, some companies are offering data disks filled with scientific information in a database format. Scholastic, for example, offers several science and social-studies databases that you can access by using PFS:File.

Some science programs deal with presenting factual information that can also be gathered from books or classroom lectures. If reinforcement is necessary, tutoring and drill-and-practice programs may be helpful. Like their counterparts in other subject areas, these programs work only if you use them. Although the knowledge that you can cram into your brain using such techniques disappears quickly if you don't apply it soon, young scientific hopefuls will go nowhere without the good grades that can result from using such programs diligently.

Textbook companies are becoming increasingly involved in the production of such materials. Publishers such as Allyn and Bacon, and Wiley and Sons, offer sets of Apple II disks with their textbooks. Other products, such as the chemistry series from COMPress and products from Encyclopedia Britannica Educational Corporation, are more general in nature and follow the standard content of a particular field rather than a specific book. The best programs in this category provide some animation and allow for some experimentation as the material is presented. Although these packages are too expensive for most individuals, they may be available through your local schools.

Since science is such a large field, you cannot expect this year's software to cover all areas. It is important, therefore, to look for good software from titles that may date back to the creation of the Apple II. If your software dealer has trouble finding products from the companies mentioned here, check with your local schools. They should have access to catalogs containing these products. ✚

Doug Green is a Binghamton, New York, computer educator.

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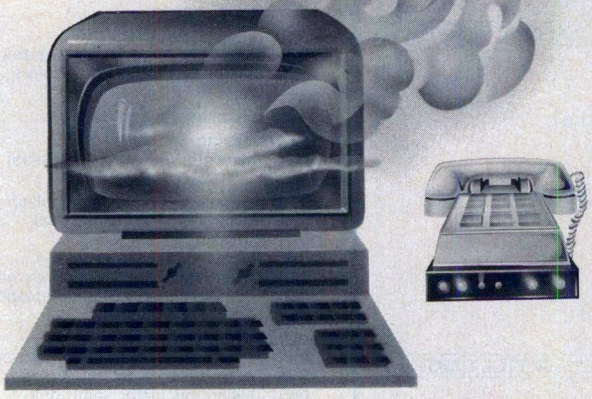

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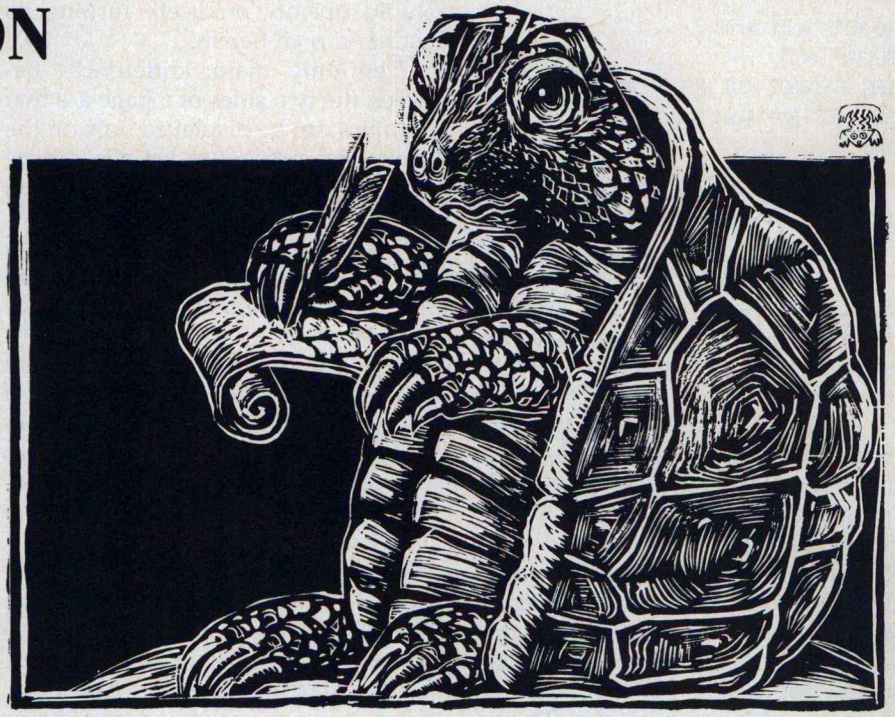
BY DAVID D. THORNBURG

A NEW VERSION OF LOGO

Programming + word processing = LogoWriter for the Apple II.



A company called LCSI has created a new version of Logo that includes the functions of a word-processing program. This product is called LogoWriter and, as of this writing, it is available for the 64K Apple IIe and the Apple IIc, as well as another computer made by some outfit with offices in Boca Raton, Florida.

LogoWriter is not a patch between Logo and a word-processing program—it is far more than that. If ever the phrase "greater than the sum of its parts" had meaning, this product deserves that label.

As with all other versions of Logo for Apple computers, LogoWriter lets you use turtle graphics. Unlike most other Apple II versions of the language, however, LogoWriter allows you to work with up to four "turtles" on the screen at once, each of which can have any of 30 shapes you can choose from a shape library. You can edit or create shapes and stamp them onto the screen in various colors or move them around at will.

Text Handling

Most computer languages have tools for dealing with strings of text. BASIC, for example, lets you create a string of text, merge two strings, extract portions of a string, and test for the equality of two strings. List-processing languages such as LISP and Logo add other features to this repertoire, but even these languages fail to provide the kinds of abilities we expect in a word-processing program.

LogoWriter lets you insert, cut, copy, paste, search for, select, and replace text in a document. Not only are commands that invoke these text manipulations usable in the way we expect for a word-processing program, but they are also part of the vocabulary of the language itself. Thus, users of LogoWriter can create their own programs to manipulate text in any way they want.

To try out the program, I created a set of procedures that encodes and decodes messages, using the following steps: Encoding the message means inserting a random character after each character or space in the original text, and decoding simply involves removing the excess letters. For example, the encoding procedure translated the message

```
This is an example of some text to be
encrypted.
```

into

```
Tchdissj siwsy lacng deoxdalmipalzee iokfc
gsnojmwen atpekxctb otjoc ebmez neejnhcjr-
jywpmtrewdy.i
```

The LogoWriter encoding and decoding procedures look like this:

```
TO CODEIT
TOP
REPEAT TEXTLEN [CF INSERT CHAR (97 +
(RANDOM 26))]
END
TO DECODEIT
TOP
REPEAT TEXTLEN / 2 [CF DELETE]
END
```

The first procedure moves the text cursor to the top of the document you're going to encode. Next, for all the characters (whose number TEXTLEN counts automatically), the cursor moves forward by one character (CF), and a random character is inserted before the selected character.

The second procedure decodes a previously coded message by alternately moving the cursor forward and deleting the selected character. Once it has deleted a character, the procedure selects the next character automatically.

ILLUSTRATION BY CARLOS LLERENA AGUIRRE

I found the creation of these procedures to be informative and enjoyable. LogoWriter's text-manipulating capabilities can be every bit as enchanting as the creation of pretty pictures with turtle graphics.

But Seriously . . .

To show that LogoWriter is not all fun and games, I decided to create a more "serious" word-processing procedure. LogoWriter has a command for replacing text, but I decided to write one of my own:

```
TO REPL :wrd1 :wrd2
SEARCH :wrd1
IFELSE FOUND? [CUT INSERT :wrd2] [TYPE
SENTENCE :wrd1 [not found]]
END
```

This procedure searches for the first occurrence of the word passed in the variable :wrd1. If it finds the word, it cuts it from the document and replaces it with the word in :wrd2. Otherwise, it displays a message explaining that it didn't find the target word.

It is easy to imagine schoolchildren who have access to this product creating new classes of word-processing programs.

The Work Space

The display screen is split into two windows. The top window represents a page from a scrapbook. This page scrolls to accommodate more text than can appear at once on the screen, and it has two sides. The text capacity of a page is limited to about 4000 characters split between both sides. The bottom window is the "command center" where you give instructions to execute procedures.

The front side of the page in the top window is generally used for the "output" of programs, and the "flip" side is for storing procedure listings. Text-handling procedures can execute on either side of the page, which has some interesting consequences. If I had the CODEIT procedure execute from the "flip" side, where this procedure was listed, the procedure would operate on itself, turning its listing into gibberish!

The only major differences between the two sides of a page are that graphics can be displayed only on the front, and procedure listings can be interpreted only if they are created on the flip side.

Pages are saved to the disk as soon as you name them, which reduces the likelihood of your forgetting to save your work.

As with all the Logo interpreters I have seen, LogoWriter is slow, and it takes up a lot of memory. Nonetheless, it offers enough unique features to open new doors to discovery to teachers and students alike.

The Product

LogoWriter is available directly from LCSI. Rather than "sell" the product, the company has decided to license it to schools for an annual fee. Once a school is licensed to use the product, it can make as many copies of LogoWriter for its use as it wants. A school that signs up for use of this program receives a nicely packaged product, complete with keyboard templates, workbooks, activity cards, a reference manual, and other support documentation.

This unique approach to software delivery concerns me. Anyone with access to the master disk can make an unlimited number of LogoWriter copies. Since (to my knowledge) single copies of the program aren't going to be available for retail sale, unlicensed copies may come home in the lunch bucket with the teacher's blessing. I am afraid that controlling the spread of LogoWriter throughout the community will be impossible.

My only hope is that LCSI receives adequate compensation for this product. It could give Logo a second chance in our schools. Our kids deserve that. ✚

David Thornburg is a regular contributor to this magazine and is the designer of Calliope, a nonlinear idea processor for the Macintosh and Apple II series of computers. You can reach him in care of this magazine.

PRODUCT INFORMATION

LogoWriter
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Ad # 6

BY ROBERTA SCHWARTZ AND MICHAEL CALLERY

NEW MAC GRAPHICS PROGRAMS

Four impressive products for creating and organizing images

This month we're looking at new Macintosh graphics programs. These are four that impressed us—all are both useful and unprotected.

First, two programs for Paintaholics, those of us who have more pictures than we can effectively manage.

PacPaint

PacPaint solves the problem of too many pictures and too few disks. It lets you pack, or compress, "paint" documents to between 30% and 70% of their original size. The simpler the image, the greater the compression. (By the way, we're using the generic designation "paint document" to describe MacPaint, FullPaint, and MacBillboard documents. In the future, the term will also refer to documents from other, soon-to-be-announced, paint programs.)

Once you've packed a picture, you can't edit or display it unless you first use PacPaint to unpack it. If, therefore, you want to keep your paint files packed, you have two choices: use PacPaint with Switcher or install PacPaint (9K) onto your application disks. The documentation states that the latter method improves productivity, since keeping more files on your active disks cuts down on disk swapping. We don't agree. The extra step of unpacking each document before we could use it became a nuisance. Thus, we suggest that you use PacPaint for archival storage. You do back up your files, don't you? Keep your working files unpacked and pack your backups. Fewer disks, less confusion, and less money.

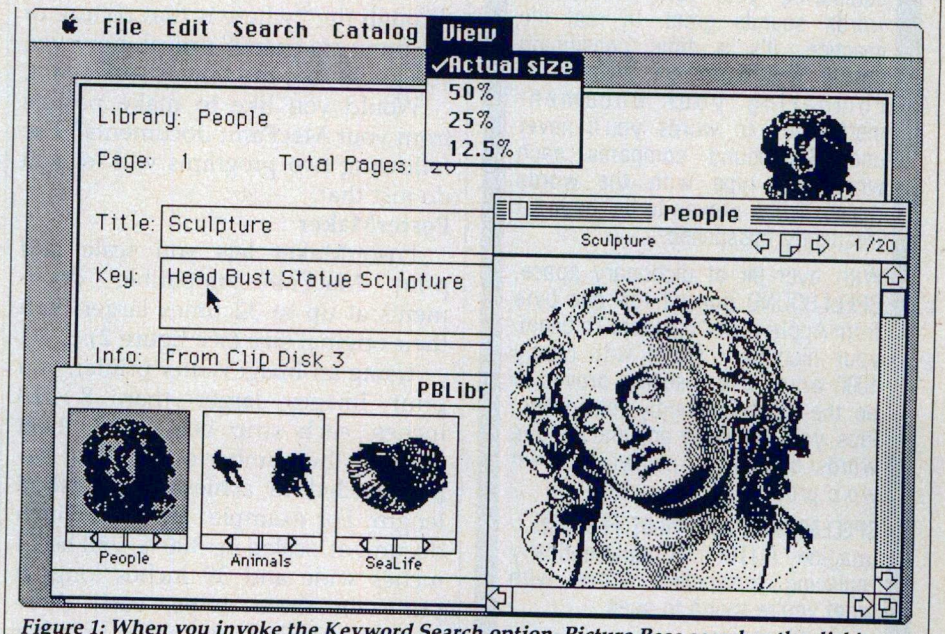

Figure 1: When you invoke the Keyword Search option, Picture Base searches the disk's libraries to find all pictures with that keyword.

Picture Base

Here's a remarkable utility for organized people (or people who wish they could get organized). Picture Base, an art-management system, lets you organize paint or MacDraw documents into annotated libraries.

If you've just started your MacArt collection, now is the time to begin organizing it.

One library, for example, might be called Events. In this library, each page (an image or possibly a group of two or three small images) would relate to holidays and special occasions. Another library, People, would contain faces, figures, and so on. For each page, you could enter keywords that would help you locate an image. A picture of a Christmas tree in the Events library, for example, might have the keywords *tree*, *Christmas*, and *holiday*.

When you use Picture Base, each library is represented by a reduction of the first page in that file (see figure 1). You can leaf through a library, one page at a time, or locate an image by invoking the Keyword Search option. Picture Base searches all the disk's libraries for that keyword and displays every image that matches it. Once you've found the image of your choice, you can copy the entire page, or a portion of it, to the Clipboard and paste it into any compatible document.

To access your libraries, you run Picture Base under Switcher or install

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Picture Base is perfect for clip art. If you've just started your MacArt collection, now is the time to begin organizing it. If, like us, you've already accumulated lots of MacPaint documents, be prepared to spend hours "filing" your art. As with any database, it takes time to enter the information. If you've been through the "where is that picture of the burst pie chart?" ordeal, however, you know that the time is well spent.

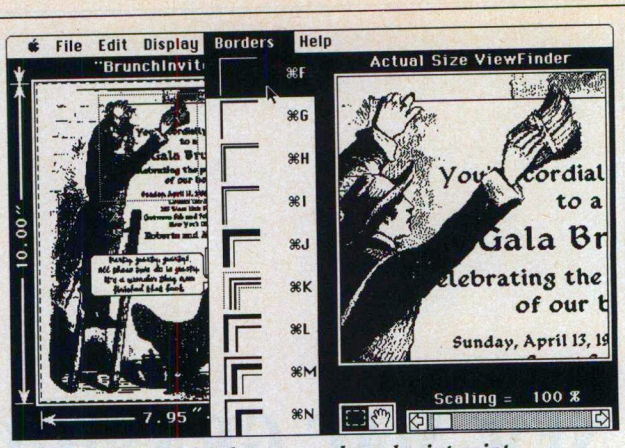

Figure 2: PosterMaker lets you scale and print paint documents up to 32 times larger than the original size.

Would you like to make posters from your MacPaint documents? The following two programs will let you do just that.

PosterMaker

PosterMaker lets you scale and print MacPaint-compatible documents at up to 32 times larger than their original size (see figure 2).

Using an ImageWriter printer, you print images larger than 8 × 10 inches, each strip being one sheet wide by the number of sheets of paper needed to achieve the desired length. For example, an 8 × 10-inch document, scaled up 300%, will be 24 inches wide and 30 inches long. It prints in three strips, each three sheets long. Paste the strips together and you have a poster. On the LaserWriter, enlargements are printed in 8 × 10-inch segments.

With PosterMaker, you can cut and paste images up to 32K in size. The program includes a border-drawing tool and digitized poster templates.

PosterMaker Templates Vol.1 is a collection of 20 19th-century poster designs. Many are humorous, and most are wonderful!

MacBillboard

Serendipity! We downloaded this shareware program from CompuServe and discovered a combination poster maker and full-featured paint program.

MacBillboard doesn't restrict your artistic endeavors to the active screen. With most of the graphics tools, the pencil and brush excepted, the window scrolls when you reach its edge, so you can continue working. With Show Page active, you can see both the full page and the drawing area while you're drawing (see figure 3).

The program offers precision scaling, an innovative multilevel FatBits, a brush editor, a paint bucket that can fill beyond the borders of the active window, and a host of printing capabilities.

With MacBillboard you can print multiple copies of a document, and you can elect to print your document traditionally (as with MacPaint), with the top half upside-down (greeting-card format), flipped sideways (iron-on format), or enlarged 2–32 times (poster format).

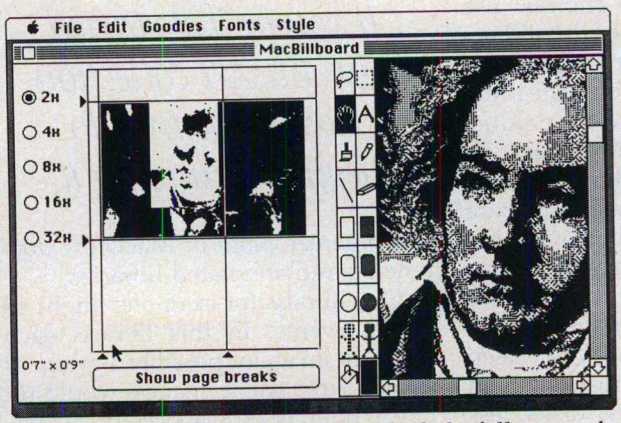

Figure 3: In MacBillboard, you can see both the full page and the drawing area while you're drawing.

MacBillboard, especially its text tool, is slower than MacPaint, but it offers so many features that MacPaint lacks, and it's priced so reasonably, that we recommend it as a companion package.

If you get MacBillboard from a users' group or on-line, please be sure to send in your money and register your copy. You'll be encouraging shareware

developers to continue offering quality programs at a fair price. As a bonus, you'll receive an excellent manual, templates, and a program called MacBanner.

RIP, Apple Graphics Tablet

Apple has officially discontinued production of the Apple Graphics Tablet—a great loss for Apple artists. Two factors made this tablet significant: the proprietary tablet ROM made the tablet simple to program, and since the tablet was an Apple product, it was a standard with large software support.

Summagraphics, manufacturer of MacTablet (see *A+*, September 1985), told us that it had a new tablet for the Apple II in the works. We hope it will be compatible with existing Apple II software.

Now that we've cleared our backlog of products, next time we'll have some tips and a tutorial. Got a question or discovered a great product? Drop us a line. ✚

PRODUCT INFORMATION

MacBillboard
Ce Software
801—73rd Street
Des Moines, IA 50312
(515) 224-1995
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Requires: Macintosh, 512K RAM
CIRCLE 407 ON READER SERVICE CARD

PacPaint
Mainstay
28611B Canwood Street
Agoura Hills, CA 91301
(818) 991-6540
List Price: $39.95
Requires: Macintosh
CIRCLE 408 ON READER SERVICE CARD

Picture Base
Symmetry Corporation
761 East University Drive
Mesa, AZ 85203
(602) 844-2199
List Price: $69.95
Requires: Macintosh
CIRCLE 409 ON READER SERVICE CARD

PosterMaker, PosterMaker Templates Vol. 1
Strider Software
Beecher Lake Road
Pembine, WI 54156
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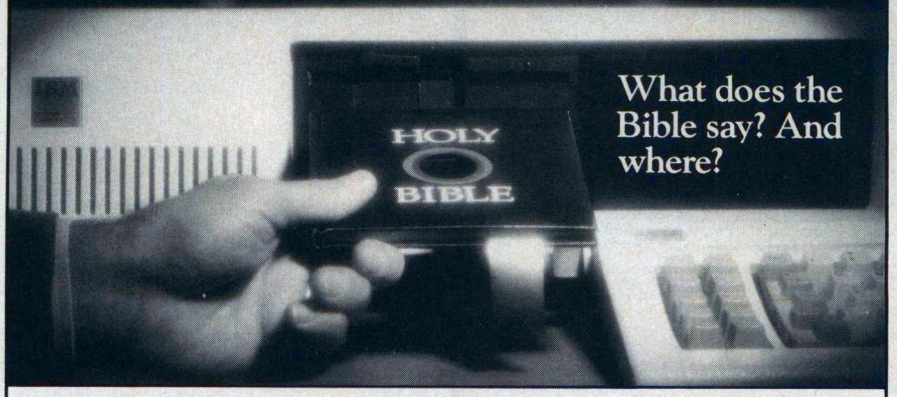

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JE868 (Expand-A-RAM) . . . $99.95

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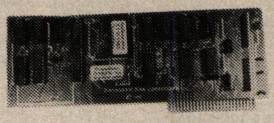

Applesurance Diagnostic Disk Controller Card

The **JE877** serves as a diagnostic tool, an assurance/maintenance tool and a dual disk drive controller. The JE877 will verify and check the operating hardware of your system each time you turn on your Apple II, II+ or *IIe*.* Test your RAM, ROM, CPU, and disk drives. Diagnostic routines may be cancelled at the touch of a key. Complete with instructions.

JE877 (DRV-1/Applesurance II) . . . $59.95

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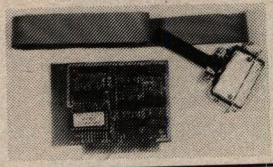

Parallel Printer Card

The **JE880** Printer Interface board is an intelligent interface to most of today's popular dot-matrix graphics printers. The JE880 is fully compatible with Apple CP/M, Apple Pascal (or FORTRAN), and most other operating systems and software packages available for Apple II, II+ and *IIe*.* The JE880 is shipped configured for the Centronics standard. Advanced text printing features include: video screen echo ON or OFF, auto/disable linefeed after carriage return, set/clear the 8th bit of the output data, set left margin, and more! Complete with instructions.

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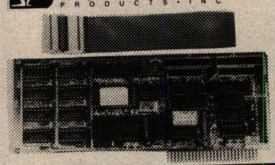

Parallel/Serial Buffer Card

The **JE883** provides the user with up to 64K of additional or buffered memory (18 pgs. of information). Using the parallel jumper cable supplied, the JE883 will attach to the JE880 (above). Parallel Card needed for operation. The JE883 includes a standard parallel input with both parallel and serial (RS232) buffered outputs. With these features you may access and buffer information to two types of printers (one serial, one parallel) simultaneously. Complete with instructions.

JE883 (P/S Buffer). $69.95

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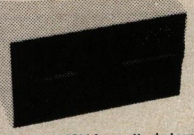
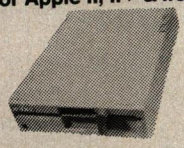
APPLE™ Compatible 5¼" Disk Drive and Controller Card for Apple II, II+ & *IIe**



- Belt-driven • 143K formatted storage
- Color matches Apple Computer
- Works with Apple Controller or other Apple-compatible controllers (JE875)
- Complete with connector — just plug into your disk controller card
- 35 tracks • Size: 6"W x 3½"H x 8-9/16"D • Weight: 4¼ lbs.

ADD-514 (Disk Drive) **$129.95**
JE875 (Controller Card) **$49.95**

APPLE™ Compatible 5¼" Half-Ht. Disk Drive for Apple II, II+ & *IIe**



- Direct drive • 143K formatted • 35 tracks • Super quiet • Works with Apple Controllers or other compatibles (JE875) above • Complete with connector-just plug into your controller • Size: 5¾"W x 1⅝"H x 8"D
- Weight: 4 lbs.

ADD-12. . . . $119.95

APPLE™ *IIc* Compatible 5¼" Half-Ht. Disk Drive

- Same specs as ADD-12 (above) except no controller necessary.

ADD-IIc. . . . $129.95

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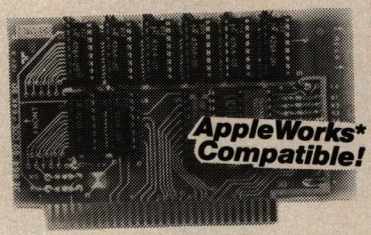
Extended 80-Column Card for Apple *IIe**



The **JE864** is an extended 80-column/64K RAM Card. This effectively doubles the amount of data that your Apple *IIe* can display as well as its memory capacity. • Ideal for word processing • Ultra High Resolution Graphics capability • Complete with instructions

JE864. . . *SALE!* . . $59.95

16K RAM Card** (Language Card)

The **JE860 RAM Card** allows the Apple II and II+ computers to expand from 48K to 64K. Complete with instructions.

JE860. . . . . $39.95**

BIG BOARD

1MByte RAM Card for Apple II, II+ and *IIe**

BIG BOARD comes complete with RAMDISK software for DOS 3.3, ProDOS, Pascal 1.2, and CP/M for Microsoft's Softcard. A separate driver is available for the AppliCard (StarCard). You can choose the active addressing mode both via a jumper on the BIG BOARD or through software commands.

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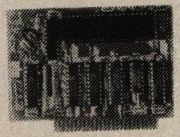
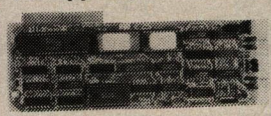
Z-Engine CP/M Interface Card for Apple II, II+ & *IIe**



The Z-Engine is an economical and reliable CP/M interface card that adds the CP/M 80 operating system to your Apple Computer • Z-80A microprocessor with CP/M 2.2 operating system and utilities • Follows Apple II Pascal Protocol • Incl. CP/M 2.2 Software • Utilities are menu-driven • Warm-boot without reset • Auto. 80-col. board and printer configuration • Manual included

Z-Engine. $129.95

80-Column Card For Apple II, II+ and *IIe**



The Smarterm Interface Card for Apple II, II+ and *IIe* provides your video monitor with an 80-col. screen display, plus the 40-column Apple II display. Smarterm II understands the standard Applesoft, Integer BASIC, and Apple Pascal commands and programs. Smarterm II also adds special punctuation characters.

Smarterm II . . $139.95

****When using CP/M, the JE860 and JE868 will only function with Version 2.20 or earlier; PASCAL (JE868) Version 1.1 or earlier.**

Quick Take

BY IVES BRANT AND THOMAS SWAIN

Softstrip Reader

A promising new way of storing and reading data

What's cheaper than a floppy diskette, easier to send by mail, and as easy to copy as a document on paper? Answer: Paper. Now you can store programs and data on paper in "datastrips," which, like the bar codes on supermarket merchandise, carry information in coded black-and-white patterns.

Cauzin Systems of Waterbury, Connecticut, has developed the new datastrip medium, which it calls Softstrip, and a $199.95 scanning device, the Softstrip System Reader, which reads Softstrips. The reader works with a Macintosh, Apple IIe or IIc, or IBM PC or compatible computer.

The bar codes you see on supermarket products contain just a handful of characters. A Cauzin Softstrip, which takes up about 2 × 8 inches on a sheet of ordinary paper, contains 1–5K of data. Four Softstrips fit easily on an 8½ × 11-inch sheet. The basic information unit in a Softstrip is called a dibit and consists of two minuscule boxes side by side. A white box followed by a black box represents a *1*, and black followed by white equals *0*.

To read a Softstrip, you need a Softstrip System Reader, which you connect to the modem or printer port on a Macintosh or to the serial card in an Apple IIe. To create Softstrips yourself, you'll need an ImageWriter I or II, a LaserWriter, or an Epson-compatible dot-matrix printer, plus a $19.95 program called the Stripper program, also from Cauzin.

The Softstrip System Reader is built into a 16-inch plastic tube. It comes with an accessory kit containing a cable, a manual, and software to adapt the reader to an Apple or to an IBM-compatible system. You can select kits for the Apple IIe, Macintosh, or IBM. Mac Plus owners must use a cable adapter between Cauzin's cable and the Mac Plus' modem port to make the cable compatible with the pin-outs of the original Macintosh. For this review, we tested the Macintosh version.

Accurate but Slow

To use the Cauzin reader, you place it directly on the datastrip itself and load the included software program, called CauzComm. You have to position the reader precisely on the datastrip, by carefully matching up a small hole on the reader with a black dot next to each datastrip. If misaligned, the Cauzin reader will not be able to read the datastrip.

Underneath the reader is an open slot. An optical sensor inside the reader travels over the Softstrip, looking through the open slot to read the data. The sensor is armed with a microprocessor that interprets the data.

On the Macintosh, once you have clicked on the Read option, CauzComm shows a pointer moving down a datastrip on the screen, to indicate the reader's progress. CauzComm converts binary information coming from the reader into files or programs readable by the computer.

The Cauzin reader performed with commendable accuracy. Repeated readings of the same datastrip yielded no inconsistencies and no programs that would not run.

Depending on the density of the information in the datastrip, the Cauzin reader transmits data to your Apple at anywhere from about 600 to 1500 bits per second. It takes roughly 22 seconds, on the average, to read a Softstrip. The factor preventing greater speed, according to Cauzin Systems, is the optical reader's microprocessor, which can work no faster at interpreting the bar codes.

The Softstrips themselves are capable of withstanding a surprising amount of abuse. Even defacing a Softstrip with pen marks did not interfere with the reader's performance. The reader operates by illuminating the datastrip with infrared light and interpreting reflected infrared light as a white area on the page. Carbon, which is very absorptive and appears black to our eyes, is visible to the Cauzin reader. Scrawling on a Softstrip with a #2 pencil will cause it become unreadable, because of the pencil's high carbon content.

The Stripper program, which allows you to print your own Softstrips, comes not on a diskette, but—you guessed it—on a Softstrip. Once read in from the datastrip, Stripper occupies about 8K on a diskette. You get two versions, one for ImageWriters and another for Epson and compatible printers. A LaserWriter version is available separately. Included with Stripper is the Dibit test program, which checks datastrips you have printed for readability.

The ImageWriter II, according to Cauzin Systems, yields more reliable datastrips than the original ImageWriter does. It also produces higher-density datastrips. The ImageWriter can fit about 1K into a datastrip, the ImageWriter II can put in about twice

that, and a LaserWriter can cram 3.5K of information into one strip. If you absolutely must have the maximum 5K on a single Softstrip, you can send a diskette to Cauzin Systems, which will print a 5K strip that you can take to a typesetter and have printed up for publication.

Error Alert

The Cauzin Softstrip reader appears to have excellent error-detection and correction capability. It checks the data as it goes, using both parity and CRC (cyclical redundancy checking) error-detection on each row of data in the datastrip.

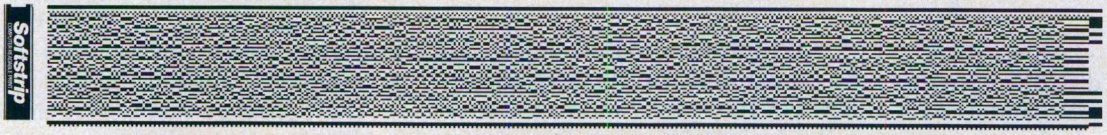
CauzComm lets you know when the reader cannot read the datastrip because of misalignment of the paper, jarring of the reader, or another reason. The reader appears to be able to tolerate about a 6% change in the dimensions of a datastrip, allowing for moisture changes but not wrinkling of the paper.

The Cauzin reader doesn't come with much documentation, but you don't need much. Once you've figured out how to align the reader on a datastrip, there's little else to learn. For the curious, it would be nice to have some more technical details on how the reader works and how to produce the most reliable datastrips.

Using a Cauzin reader cannot compare to the ease of just popping a diskette into a drive. The datastrip medium makes life easier not for you,

TIPS FOR SOFTSTRIP SYSTEM READER USERS

1. Don't jar the reader while it is scanning a Softstrip, so it won't "lose its place." 2. If your printer is turning out datastrips of poor legibility, you can make them easier for the Cauzin reader to read accurately; just make a photocopy of the datastrip. In particular, Xerox copies have a high carbon content, and the Cauzin reader is contrast-sensitive to carbon. (Carbon absorbs the infrared light that the reader uses to read a datastrip.) 3. If you accidentally mark a Softstrip with ink, it will probably not matter at all. If you spill coffee on it, don't despair; just photocopy the datastrip quickly, before the liquid wrinkles the paper and dimensional changes make it unreadable. 4. Folded photocopies are likely to be unreadable, because the carbon actually flakes off the crease in the paper.



***Fastermind*, an Applesoft BASIC program by Tim Hartnell, from the Cauzin Apple Sampler Library**

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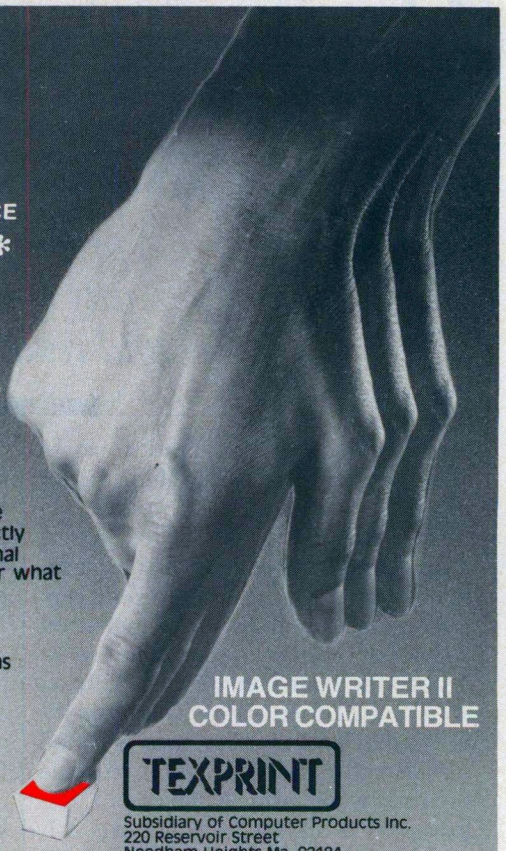

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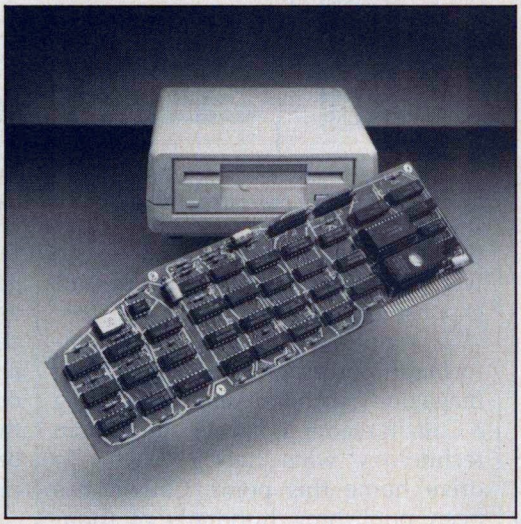

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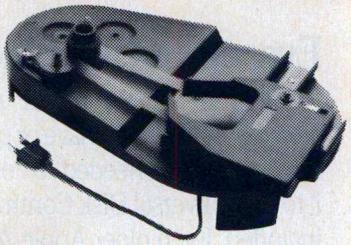

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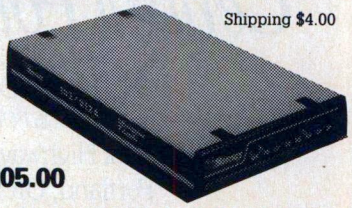

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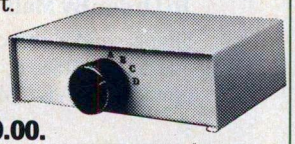

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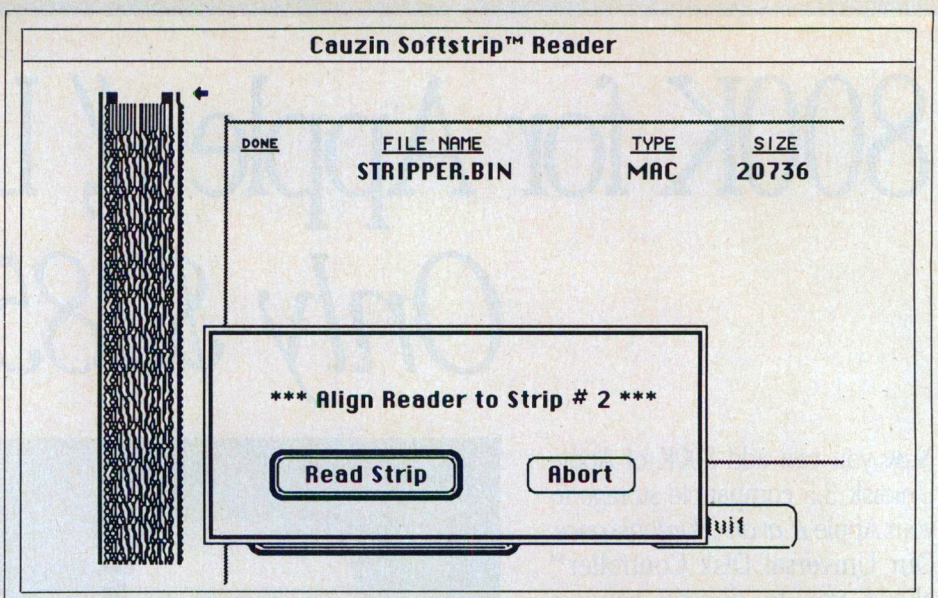

The Softstrip Reader program (available for both the Apple II and Mac) prompts you to read the next strip when programs or data are contained in more than one strip.

the user, but for the publisher who wants to disseminate information inexpensively.

If you have a choice of retyping information or program listings from a magazine or other document or using a Cauzin reader, however, the Cauzin technology wins hands down. To drive home this point, Cauzin has been publishing hundreds of thousands of copies of small programs in magazines.

The CauzComm program is quite simple to use. It has just a few menu choices, and they are all self-explanatory. The Stripper program is equally easy to learn and use. When a program or file occupies more than a single datastrip, CauzComm tells you which Softstrip to move the reader to next. If a single strip fails to read in correctly, CauzComm does not bomb; it simply offers you the opportunity to read the same datastrip again.

Support

Cauzin Systems has a toll-free customer-support number, which is often busy. We got through more rapidly to the company's regular number, which is not toll-free, but then had to hold for three or four minutes. The support people were always friendly and knowledgeable, once we got through to them.

Who Will Benefit?

The Cauzin reader reads Softstrips accurately and rather slowly and costs about the same as many floppy drives, although floppy drives are much faster.

Publishers will find it helpful for disseminating not only programs but also templates and tables of data. Datastrips are cheaper and less damageable than diskettes. Datastrips are also appropriate as a high-density bar code in settings such as large insurance companies that frequently send out rate sheets and actuarial tables to thousands of branch offices. The branch offices need to put this information into their computers.

Not only are floppy diskettes expensive, but these offices may also have a mixture of Apple II, Macintosh, and MS-DOS computers. As long as each office has a Cauzin reader and the right accessory kit for each computer, the headquarters can send the same datastrip to everyone. ✚

Ives Brant has evaluated new products for ComputerLand Corporation and PacTel InfoSystems. He is currently product review editor at a leading microcomputer trade publication. Tom Swain is a staff scientist at the Lawrence Berkeley Laboratories in California who has worked with Apple computers for five years. His first Apple II was a gift from Steve Wozniak, with whom he studied engineering.

PRODUCT INFORMATION

Softstrip System Reader
Cauzin Systems, Inc.
835 South Main Street
Waterbury, CT 06706
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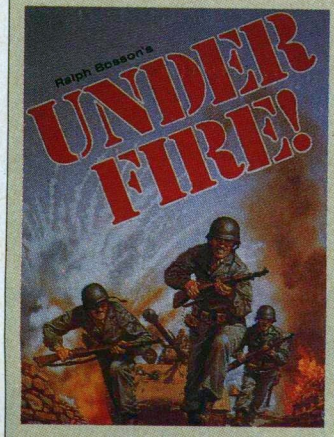


Under Fire! is an outstanding tactical simulation of squad-level World War II combat.

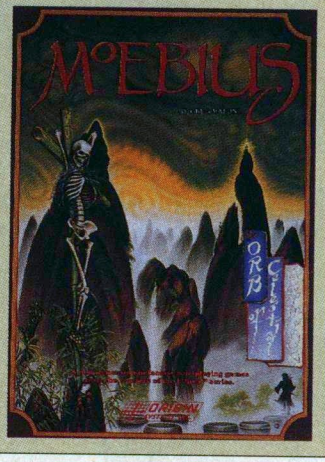
SQUAD TACTICS IN WWII

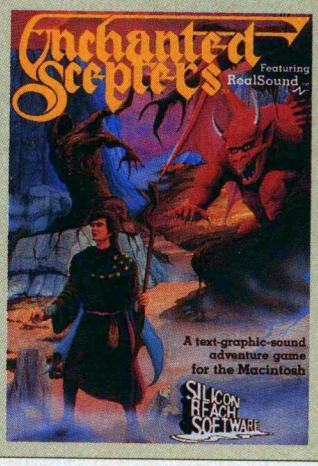
A friend of mine, a first lieutenant in the U.S. Army Reserve, once introduced me to a board game called Squad Leader, published by The Avalon Hill Game Company. Actually, *game* is kind of a misnomer; *highly detailed, complex, tactical World War II combat simulation* is more accurate. In his line of work, this game is a training aid. In my line of work, it is a game. Predictably, my first effort at leading cardboard heroes resulted in 90% of my force being killed, wounded, or routed somewhere in Stalingrad.

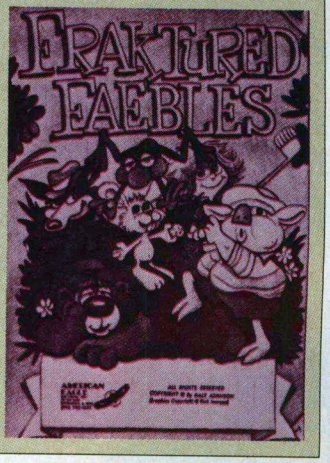
These tactical trepidations came back to me as I unwrapped Under Fire!, a tactical World War II combat simulation for your Apple II published by, surprise, surprise, The Avalon Hill Game Company. It puts you in command of an assortment of infantry, tanks, and artillery against a hidden enemy. Two players compete head-to-head, or one person plays against the computer.

Under Fire! offers nine prepared scenarios covering a variety of tactical situations—from house-to-house fighting in a city to mobile, blitzkrieg-like firefights across open terrain. You can alter the composition of your forces for each scenario and, for the truly inspired, a "map maker" disk allows you to create new maps. Avalon Hill calls it a "wargame contruction set." I call it a flexible, valuable addition to the package.

The program takes care of all bookkeeping chores—ammunition expenditure, firing distance, combat results, sighting, terrain effects, and so forth—leaving you to concentrate on tactical planning. The mechanics of moving troops and firing weapons with a joystick are fast and easy to learn, although mistakes at the beginning are common. On one occasion, I thought I was moving a leader to join a squad. Imagine my surprise when an artillery barrage landed on my own troops.







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One distressing aspect concerns the display of sighted enemy troops on the map after each "period." Usually, enemy troops that pop into sight during a battle hang around long enough for you to shoot at them. Hence, halting play to show all sightings after each of the 24 periods in each player's turn burns up a lot of time.

Finally, although the program tallies casualties, "determining who won and who lost is a subjective task saved for the greater glory of the argument before and after the game." That is an interesting concept, but too bad programmer Ralph Bosson did not include some victory point algorithm.

Make no mistake, Under Fire! is an outstanding tactical simulation of squad-level World War II combat. Avalon Hill is already planning to publish an "extended units" disk with more troops and vehicles.

War-gamers should take a serious look at Under Fire!. It is an excellent war game, and you may even learn a thing or two about tactics.

Russ Lockwood

Under Fire!
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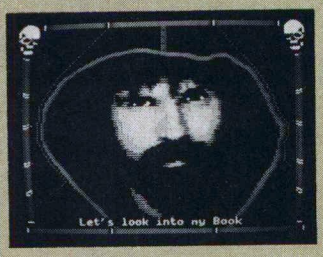
Somewhat in the mold of Ultima and Questron, Moebius features a Kung Fu theme replete with tiger-infested bamboo forests, shrines subverted by spell-casting evil monks,



sprawling palaces, and dismal prisons patrolled by vicious guards. Ninja assassins silence opponents of their dark lord, and hanging on poles about the countryside are the corpses of Kaimen's latest 'examples.' Nor are

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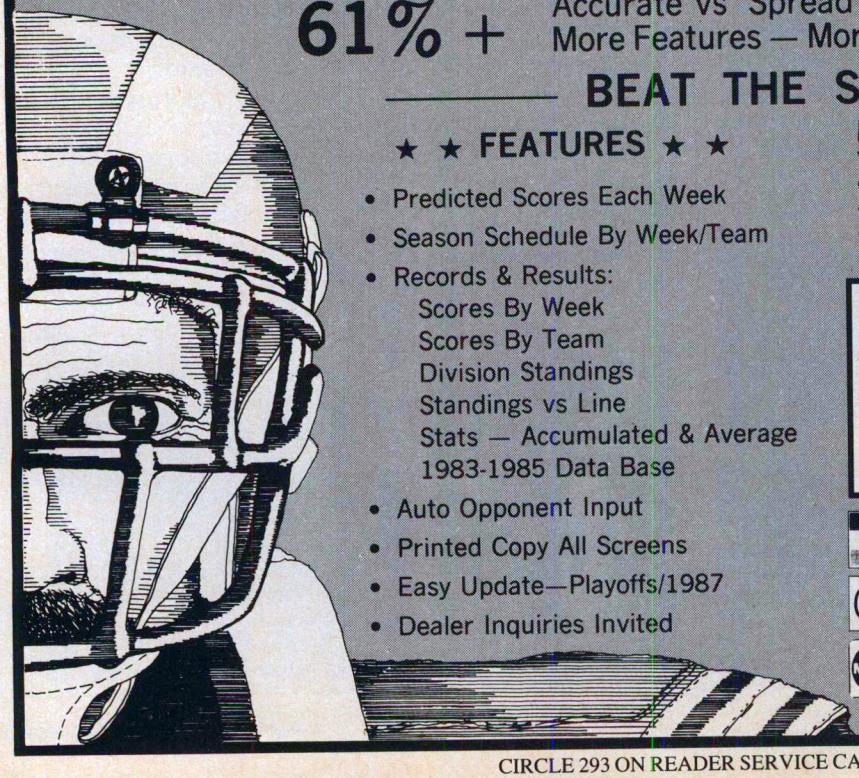

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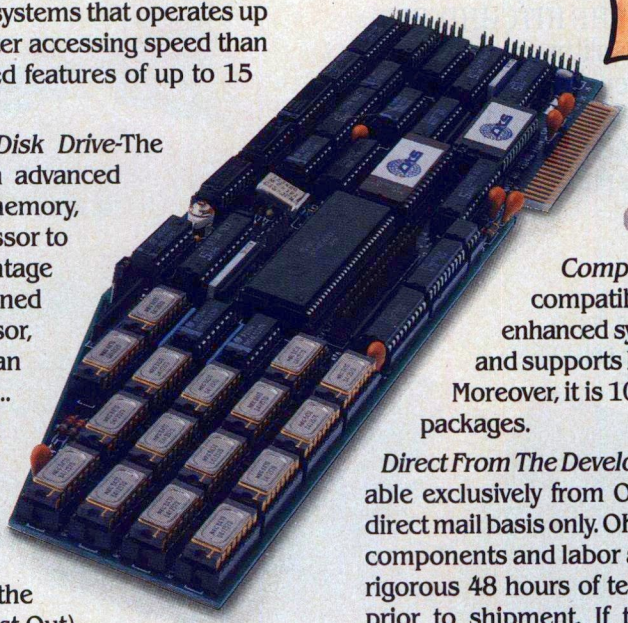

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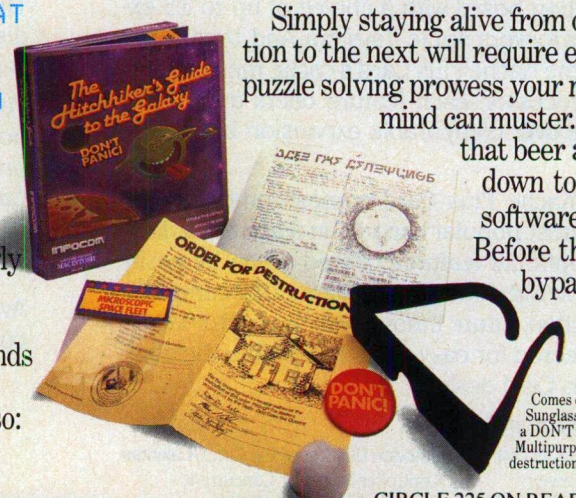

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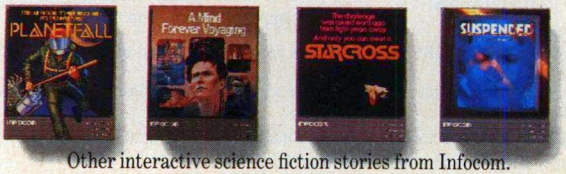

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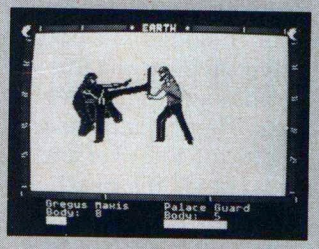
That's Entertainment

Moebius incorporates innovations sure to affect future game releases.

such adversaries the sole challenge. In this stricken land, you can easily perish from lack of food or water, and at night the display goes black, opening the way to surprise attack.

As you quest for the restoration of harmony, much of the game involves a careful balancing of challenges and resources. A pure karma allows you to contact peasants who offer food, torches, and valuable information, and some treasure chests yield enchanted lenses that help you locate drinkable water on a special map display. The good monks you liberate supply charms and prayers imparting such magical abilities as water-walking, teleportation, and invisibility. Using magic is cumbersome, though, and drains away body and mind points. Combat victories strengthen karma, increase experience, and lead to promotion, yet they always involve some risk of defeat, which results in the loss of karma or even in death.

Possibly the best planned and most active of any major adventure game, Moebius incorporates innovations certain to affect future game releases. Armed or barehanded, combat occurs in an expertly illustrated, smoothly animated Karateka-type sequence in which you direct your character's every fighting movement. Particularly at higher-speed settings, the



action is very convincing, without any of the drudgery that seems to plague other combat schemes. Rather than floating above the landscape as a player, you are a participant *in* the scene.

Supported in typical Origin Systems fashion (the package includes a nifty ninja-type scarf!), the game does take a bit of getting into. (Hint: Don't spend a lot of time picking good names for your first two or three characters.) Remarkably grim yet curiously addictive, Moebius is a uniquely exhilarating long-play game experience.

Jeff Hurlburt

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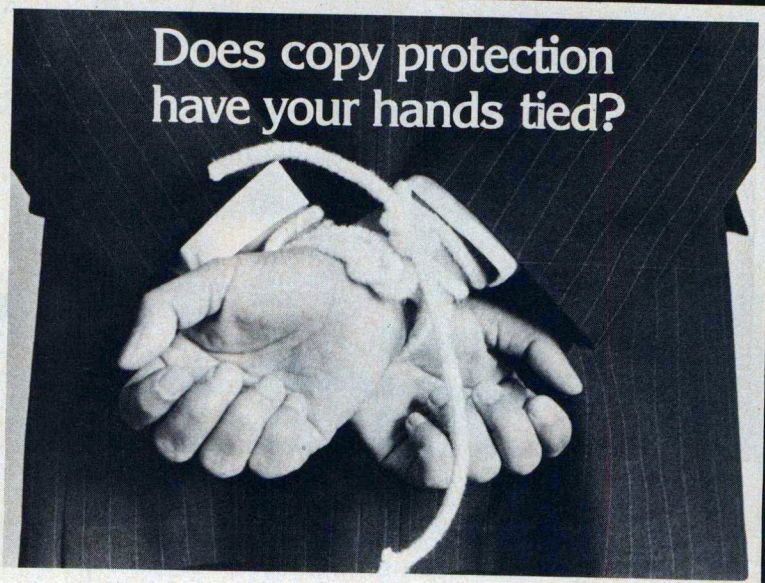

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Sabre you are called, apprentice of Elron, the court wizard to the throne of Callion. It is a beautiful morning when you awaken in your cubicle to find yourself summoned to the King's chambers. Life seems a little less cheery after your royal audience; now instead of being responsible for your regular duties, you are responsible for the fate of your homeland.

A host of Hurks has massed itself at the southern border of Callion, intent on invasion. For those of you who do not read the papers, the Hurks are a nation of people with all the humor of an ICBM and the social graces of an Imperial Storm Trooper. Not really the sort of folk you'd want as neighbors, let alone as brutal overlords.

The only way to repel the Hurks is to use of a mighty spell being prepared by the mage Elron. The spell lacks four main ingredients, however: the Enchanted Scepters, ancient embodiments of the universal principia lost decades ago in the great wars. The scepters have been scattered over and under land, in a treacherous Mayan pyramid, and beneath the sea in fabled Atlantis, all places you alone can find.

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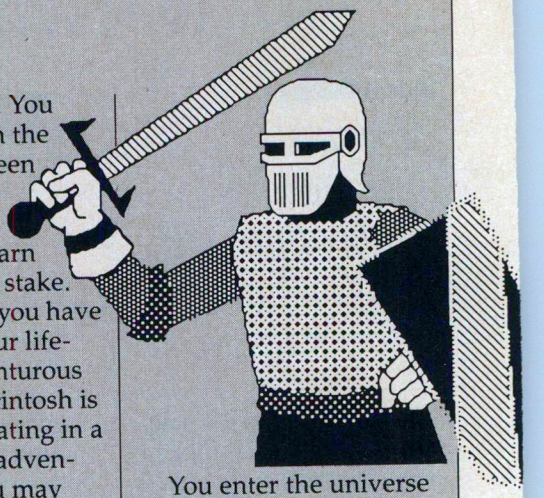

The first thing you have to learn about your lifestyle in this adventurous game for the Macintosh is that you are operating in a different kind of adventure than any you may have seen or heard of from Infocom or Brøderbund or any other purveyor of cybernetic dreams. Silicon Beach Software has created a new kind of adventure world, one filled with sound and fancy, interactive graphics, mouse and keyboard operative commands, and that certain sort of whimsy that makes magic so real.

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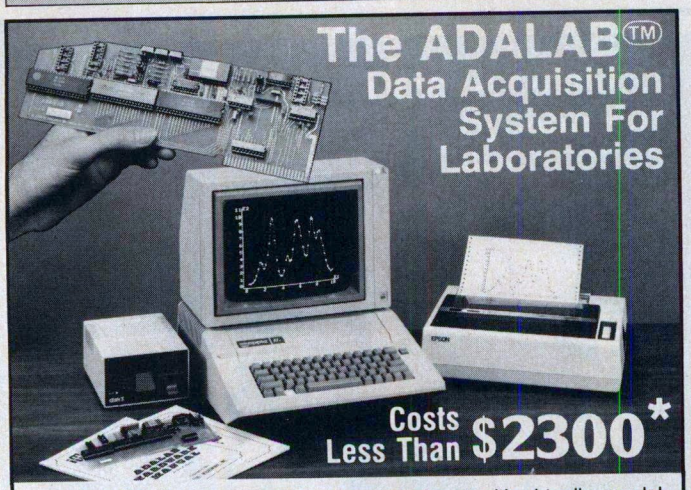

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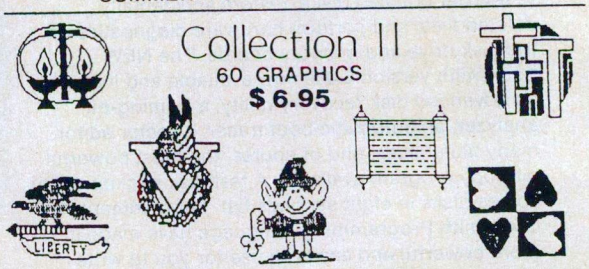

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ronment. When you battle the various monsters and bad guys (and, believe me, you will be battling a lot of baddies), you will hear the sound of the fray. Some of these sounds may be clues. You would do well to listen carefully.

You find that the mystic power of the Macintosh does not end with the creation of a sonic environment. You must take the sword that lies glistening at your feet in order to start the adventure. You can obtain the sword in the time-honored fashion of all adventures, addressing yourself to the keyboard and, with index finger rigid, punching out GET SWORD <cr>. Callion lets you accomplish all this with one quick click of the mouse, however. Similarly, when it comes time to do some progressive beastie bashing, you select your weapon of choice from a pull-down menu and put it to use the same way. If you're feeling particular, you can also invoke the Aim command from the keyboard—type aim head, for example.

You move around within Callion with the mouse or the keyboard, using the ⌘ key and the first letter of the direction you wish to travel. You can invoke other functions such as Look, Search, and Inventory the same way. I can't stress the importance of the Search command enough. It is one of the most important tools available to you for surviving and succeeding in your quest for the enchanted scepters.

Planning your journey requires a little forethought. You will find yourself dying fairly frequently, missing something that was inconsequential then and desperately needed now, and so on. The best way to deal with these eventualities is to save your position frequently and under a different name every time

Be ready, all ye who choose to follow the perilous pathways of Callion; deception and danger lurk at every turn.

(all ye egotistical monster mashers out there, take heed; you are listening to the voice of experience). Any other course of action will swiftly bring you to the brink of madness.

So be ready, all ye who choose to follow the perilous pathways of Callion; treachery, deception, and danger lurk at every turn. The scepters are not easily won, and only your ingenuity can save your skin and that of your compatriots. This adventure will prove to be a true test of your mettle. May the power of the scepters smile upon your efforts.

Ken Goehner

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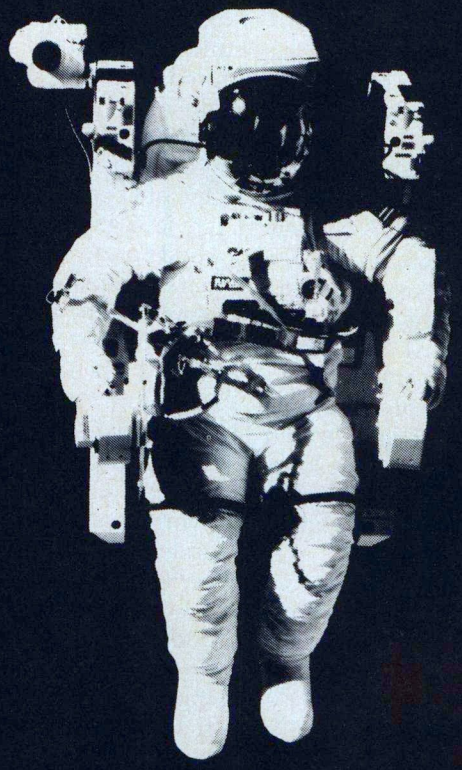

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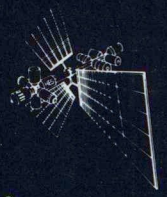

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That's Entertainment

ROCKY AND BULLWINKLE IT AIN'T

In 1967, when Neil Simon was riding the crest of his success with *Barefoot in the Park* and *The Odd Couple*, his play *The Star Spangled Girl* opened on Broadway. One critic remarked: "Neil Simon . . . hasn't had an idea for a play this season, but he's gone ahead and written one anyway." Alas, I fear the same statement can be paraphrased and applied to Dale Johnson's newest graphic adventure game, Fraktured Faebles.

When you encounter a game in a store or through an advertisement, what's the first thing that usually grabs you? The title, of course. And Fraktured Faebles is a terrific title. To my mind, it conjured up images of the old Rocky and Bullwinkle "Fraktured Fairy Tale" cartoons, which, as I recall, were adroit send-ups of old, familiar war-horse fables. One of Dale Johnson's previous games, Sherwood Forest, was just that—a flip, hip, sassy version of the Robin Hood legend.

Now I believe that any adventure game has only one crucial element: a compelling plot. Whether or not it has graphics, has a command parser that understands more than a verb/noun syntax, or is packaged with amusing doodads is of relatively little importance. The game must have a central story that is interesting enough

Any adventure game has only one crucial element: a compelling plot.

to warrant spending many hours of your valuable time playing it.

In Fraktured Faebles, you are plunked down in the middle of a forest, not knowing who you are, why you are there, or what you have to do. Strangely enough, two other games on the market have the same situation as the primary feature of the game—your quest is to find out who you are, etc. I'm referring to Amnesia (from Electronic Arts) and Mindshadow (from Activision). But self-discovery is not the goal of Fraktured Faebles. Here your objective, if I may be so bold as to tell you, is to find and then awaken Sleeping Beauty. Along the way, you will have to interact with such diverse characters as Rip Van Winkle, Goldilocks and the Three Bears, Red Riding Hood, and several members of the Alice in Wonderland crowd. The only reason for this strange mix is, as the beginning of the game informs you, that a witch mixed up all the fairy tales, dumped you into the forest, and left you with only your ability to solve puzzles.

While we're on the subject of puzzles, you must

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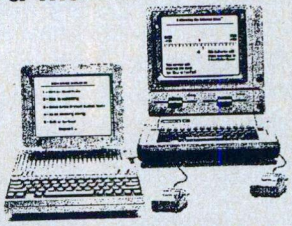

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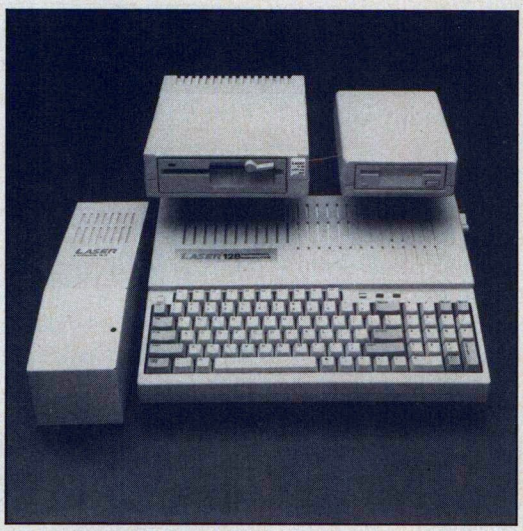

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You mustn't be afraid to try any notion that comes into your head.

know by now that your overall task in playing any adventure game is to perform actions in a certain specific sequence, usually determined by trial and error. In this regard, it is helpful when the game gives you back some indication that you are on the right track. Fraktured Faebles has no such indicator, and I spent much of the game worrying about whether I was doing the right thing. Moreover, some of the puzzles are tough but fair, and a few—such as the tea-party sequence, which drove me mad—are downright bewildering. In this section of the game, one of the characters tells you that you will have to trust your blind luck. How right that is, as this puzzle leaves you groping around in the dark, both literally and figuratively.

Although Fraktured Faebles is a fairly small game—it has only 22 mappable locations—you will have to visit some of those places more than once. If you do play this game, be sure to look at everything; all the object descriptions and some of the object names contain subtle clues that help you figure out what to do with them. And, as always with this type of game, you musn't be afraid to try any strange notion that comes into your head, but be sure to use the handy save-game feature before you do anything risky.

Fraktured Faebles is leavened with healthy doses of humor.

On the plus side, Fraktured Faebles is leavened with healthy doses of humor, an element that is missing from many adventure games. For example, a stern-looking bird perched in a tree is described as a "rare overprotective American eagle." And once again, programmer Johnson is teamed with the clever Rick Incrocci, who designed the striking graphics for their two previous outings, Sherwood Forest and Masquerade. But as for the major question: should you get this game? I think that despite Fraktured Faebles' good points, it remains a wonderful title in search of a plot.

Donald Oliver

Fraktured Faebles
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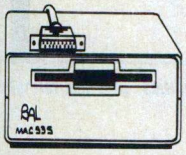

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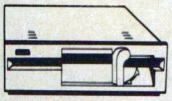

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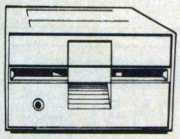

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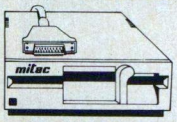

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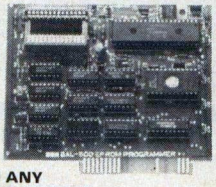

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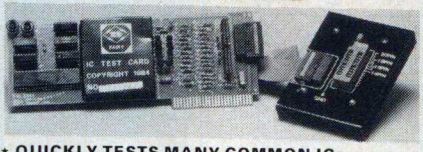

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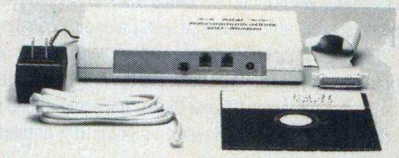

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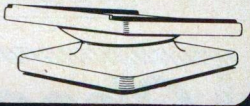

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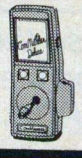

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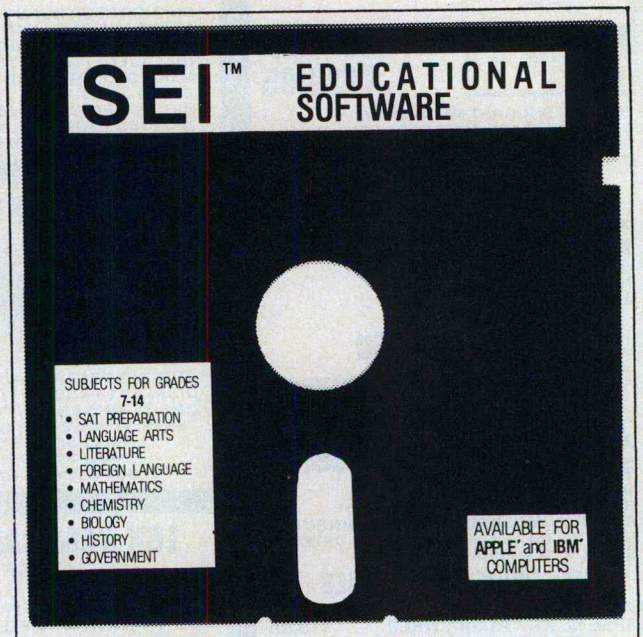

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The Macintosh Section

HARDWARE *BY STEVE ROSENTHAL*

A high-performance output remedy:

THE POSTSCRIPT PRESCRIPTION

The Apple LaserWriter isn't the only high-performance output device you can plug right into a Macintosh—because the Macintosh speaks the device-independent PostScript page-description language, you can connect it to any PostScript-capable output device. Although the number of PostScript devices is still quite small, the steadily growing selection already includes several laser printers and two typesetting machines, and as more Apple II applications add PostScript-format output, you'll have the same expanded set of choices for output devices as does Apple's more upscale computer.

PostScript, in effect, acts as a standard software interface, isolating the system generating the data—the Macintosh or Apple II—from the printer or other output device—the LaserWriter or other alternative—that produces the text and picture output. Thus, you can select from among PostScript output devices the device that most closely matches your needs without having to redo any of your programs, data, or basic operating procedures.

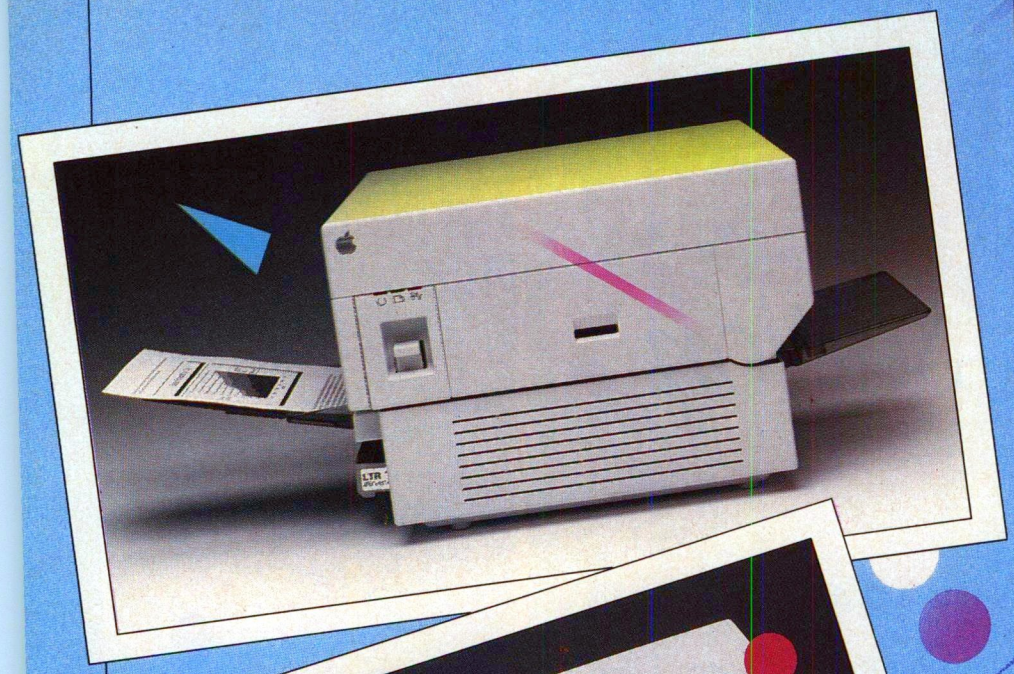
In addition, you can print the same file out first on a lower-performance device such as a laser printer and then later on a higher-performance (and higher-cost) unit such as a typesetting machine. Because even the more modest PostScript devices produce correctly formatted output (up to the limits of their resolution), you can use the simpler device to make "proof copies" and save the more expensive devices for the final copy.

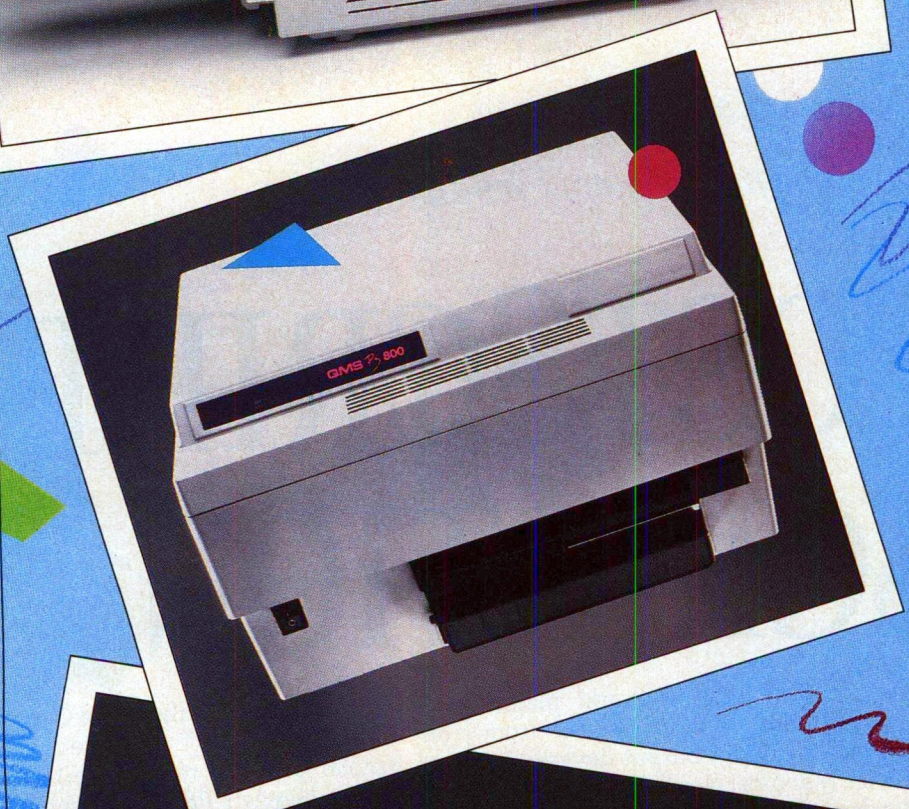
Apple's Own

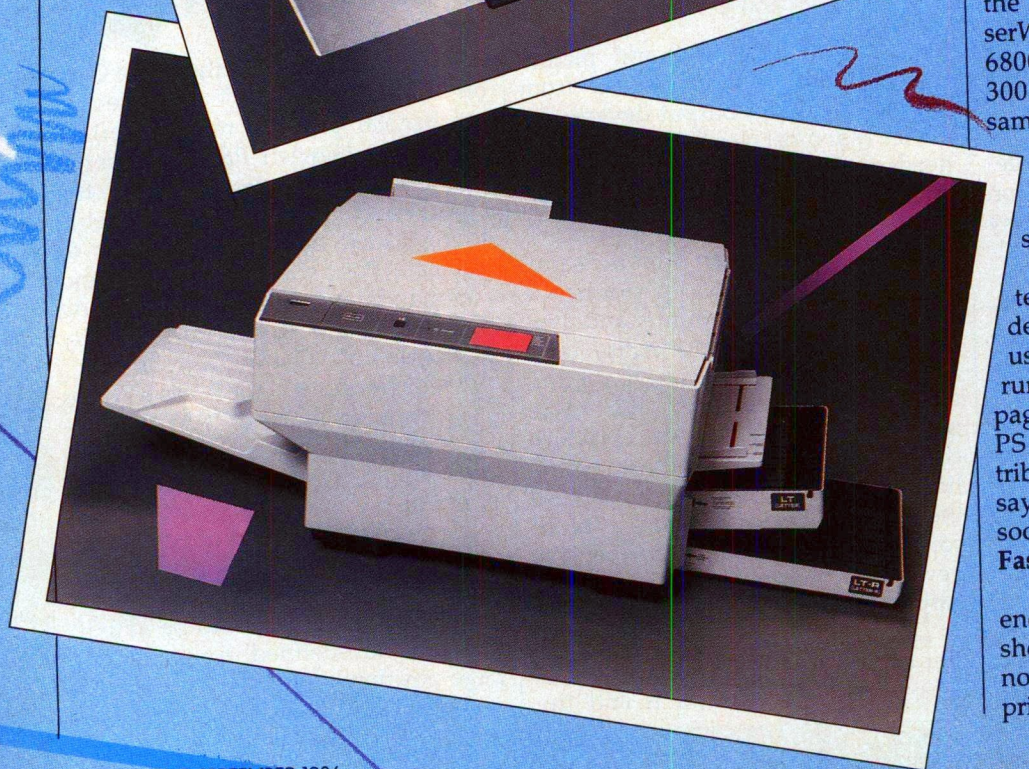
The Apple LaserWriter was the first of the publicly announced PostScript laser printers and is still the best known. Based on the same Canon "marking engine" (the electromechanical printing mechanism) as that of the Hewlett-Packard LaserJet and a dozen other laser printers, the LaserWriter contains its own highly sophisticated on-board computer to translate PostScript descriptions and commands into the corresponding dots and blank spots that actually print (see box "Getting RIPped").

Furthermore, the LaserWriter contains enough RAM (1.5 megabytes) to keep track of every single dot on a full-size sheet of paper at the marking engine's maximum resolution of 300 dots per inch (dpi). A full bit image is necessary if you want to mix text and graphics on a page and if you want to be able to use software-defined fonts at any page position.

The LaserWriter Plus, announced







last January, provides largely the same capabilities as the LaserWriter, but it has more (11 vs. 4) built-in typefaces (*fonts*, in Apple's terminology) and some minor improvements in the PostScript processor.

Both versions of the LaserWriter print out at a maximum rate of eight pages per minute, although the first copy of a given page may take considerably longer while the PostScript processor builds up the image. Printing, which involves a xerographic process much like that of office copy machines, can take place on most standard sizes of office paper or on transparencies.

More RAM

Quality Micro Systems (QMS), which makes a full line of laser printers, many of which are intended for use with larger computers, claims that its eight-page-per-minute Canon-based printer works 25–30% faster than the LaserWriter. The key difference, the company says, is that the QMS PS 800 has 2.5 megabytes of user-accessible memory, as opposed to the 1.5 megabytes in the LaserWriter.

That higher storage capacity is especially important for jobs with many downloaded typefaces and graphics. With the increased memory, the PS 800 can work with more fonts and images at once and spend less time on the relatively slow process of repetitively loading fonts that have had to be bumped temporarily because of space limitations. In other respects, the PS 800 is fairly similar to the LaserWriter. It also uses a Motorola 68000 for its processor, has the same 300-dpi print resolution, has the same typefaces (Times, Helvetica, Courier, and Symbol) in permanent memory, and is equipped with the same PostScript page-description language.

QMS has also announced a faster machine in the same series for delivery later this year. The PS 2400 uses a Xerox printing engine and runs at a maximum speed of 24 pages per minute. Initial sales of the PS series were through the QMS distributor network, but the company says it will start retail distribution soon.

Faster and Faster

If eight pages per minute is not fast enough or you want to use larger sheets of paper, you can turn right now to the Dataproducts LZR-2665 printer. This almost-200-pound laser-

printer unit churns out pages at a swift 26-page-per-minute maximum, again at a resolution of 300 dots per inch. Unlike the LaserWriter or the two QMS printers, however, the LZR-2665 has a maximum page size of 11 × 17 inches.

The LZR-2665 also uses a fully bit-mapped page, and to accommodate its larger maximum page size, it comes equipped with 2.5 megabytes of memory. In addition, you can use that 2.5 megabytes as two page images for 8½ × 11 sheets, speeding throughput by allowing the printer to lay down one page image in memory while printing another.

Connection to the LZR-2665 is via a standard RS-232 serial port or AppleTalk interface. Like the LaserWriter, the LZR-2665 has a Diablo 630 emulation mode, so it can work as a letter-quality-printer replacement with software that doesn't know anything about laser printers.

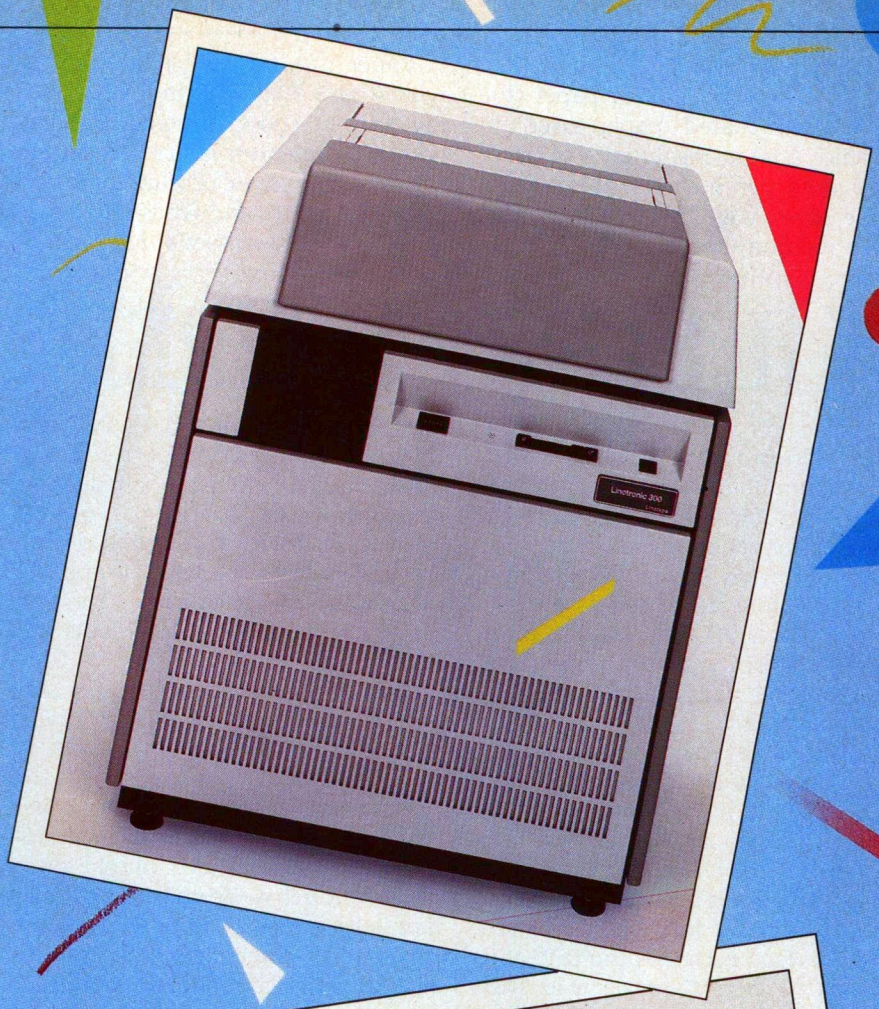
For multiuser and/or high-throughput applications, you can get an optional paper cassette for the LZR-2665 that holds 500 sheets or a sheet feeder that handles 1500. You can also add a ten-bit sorter/collator mechanism; a "Face Down Stacker/Flipper," which stacks the pages face down but in the right order, so you don't have to flip each page individually; and a "Face Down Stacker with Offset," which distinguishes each print job by offsetting it on the output pile by a small distance.

Naturally, this kind of serious production capability doesn't come cheaply. A Dataproducts LZR-2665 will set your company back about $22,900.

True Hi-Res

Although the 300-dpi resolution most laser printers provide may be impressive compared with the ordinary output of impact dot-matrix printers, it is not nearly as detailed as that of most true typesetting systems. You may not be able to see the difference on coarse papers or in single isolated words, but there is a visible and appreciable difference between typeset matter and even good laser-printer results. Linotype Company, one of the major vendors of typesetting equipment, started working with Apple and Adobe (the developer of PostScript) even before the LaserWriter's introduction and is now out with two typesetters (in its Linotronic line) that handle PostScript files.

The Linotronic 100P (the *P* is for



Among the output devices that work with the PostScript page-description language are Apple Computer, Inc.'s LaserWriter printer (opposite page, top), Quality Micro Systems' QMS PS 800 printer (opposite page, center), DataProducts' LZR-2665 printer (opposite page, bottom), and Linotype Company's Linotronic 100P and 300P typesetting machines (above).

PostScript) is a desk-size unit that prints on exposed film or paper (the "RC" resin-coated paper used in graphics arts) at resolutions of up to 1270 dots per inch. A faster-speed mode gives you 317 dots per inch, and a medium-speed mode, 635.

Paper can be up to 11.7 inches wide (that's 70.5 picas in the measuring system most printers use). As with most medium-scale typesetting systems, the paper or film comes on rolls in cassettes and feeds into a second light-tight cassette after exposure. A separate processor does the developing and fixing of the image.

The 100P has an AppleTalk connector, so you can use it on a network or plug it in instead of a LaserWriter. In addition to the intelligence provided in the PostScript processor, the basic Linotronic 100P includes its own 68000 microprocessor and 512K of memory.

The Linotronic 300P is similar in function but offers a slightly wider page (12 inches, or 72 picas) and much higher resolution: a maximum of 2540 dots per inch.

The Linotronic machines are not meant for casual users. In addition to the price of the typesetting machine itself ($19,950 for the 100P and $47,950 for the 300P), the cost of supplies and processing is several times as much per page as for laser-printer methods.

The Linotronic output is strikingly more detailed, however, a fact that is readily apparent if you do a side-by-side comparison of magnified images (see figure 1).

Other Voices

This short initial look at PostScript-compatibile output devices is like an aerial snapshot of the early days of a fast-growing community. In addition to what is already built up, a large number of plots have been laid out, and signs of new construction are everywhere.

Other firms that have announced PostScript printers as of May 1986 include Apollo Computer, Digital Equipment Corporation (DEC), Metaphor, NBI, Prime, Sun Microsystems, and Wang Laboratories. Some, such as Sun, are relabeling other printers (Sun uses Apple's LaserWriter); others are creating their own combination of marking engine and processor. There are also rumors—and so far only rumors—of far more inexpen-

GETTING RIPPED

The process of turning PostScript or any other formatted output into an actual printed page encompasses two major steps: rasterization and marking.

Rasterization, or the conversion of the input into an ordered series of dots, is necessary because the printing mechanism of a laser printer actually paints a page by sweeping the laser beam across a stacked set of horizontal lines that cross the page, in much the way an impact dot-matrix printer prints by sending the printhead to and fro across each line on a page or a video terminal creates a display by moving an electron beam across and down in a regular pattern.

The sweep pattern—the raster—is fixed, a necessary approach to engineering the fast, precise movement for bringing the beam to each possible point on the page at resolutions of hundreds of dots per inch and more. The printer's built-in computer turns the laser beam on or off at each point in the pattern to create images.

Doing the conversion is a computationally intensive task, especially when the input is device-independent and must be scaled and fitted to the characteristics of a particular marking engine. The "raster image processors" (RIPs) that do the task are often comparable to personal computers or even small minicomputers in power.

Even at the fast internal speeds that typify most RIPs, rasterization can eat up a significant amount of time. Taking a full page of PostScript output and converting it to dot patterns can take you as long as several minutes on some laser printers, depending on the complexity of the PostScript code and the detail level of the image.

Rasterization is also memory-intensive. Because the marking engine needs its input as a fixed rate that matches its electromechanical cycle, the RIP must have the full-page image ready and waiting to send out at a rate of millions of dots per second (a rate comparable to that of a video signal). Storing that image takes one bit of memory for each possible dot on the page's raster pattern, or about 1 megabyte (8 megabits) for an 8½ × 11-inch page at 300 dots per inch.

Laser marking engines do the second half of the job, taking the dot images in raster order and turning them into black-and-white spots on the page. The technology is very similar to that of an ordinary office photocopier. A light pattern caught on a photoconductive drum attracts toner that is then fused onto a sheet of paper to create the image. In the case of a laser printer, though, the optical image is created not by reflection of an already existing page but by the dot pattern the laser beam creates as it sweeps out the raster pattern.

All current PostScript laser printers are page printers rather than serial printers: once the output device has started a page image, the process must continue at a fixed pace until the print cycle is complete. Once a single image for a page has been created, the cycle can repeat over and over. The rated speed of the actual print mechanism is for this repetitive rate, which is also the rate it would take the printer to produce the first page only if the RIP could do its job in nothing flat.

Naturally, the abilities to create a larger image, move the beam faster, or control the beam more precisely are all difficult to engineer and therefore relatively expensive. Printers that can produce larger images are often rated for longer lifetimes, however; use more hardy photoconductive surfaces and more flexible toner-replenishment systems; and can therefore claim a significantly lower operational cost in high-output applications compared with small desktop printers such as the LaserWriter.

Figure 1: A comparison between output from a laser printer (left) and a Linotronic typesetter (right). Lower- and uppercase letter I's are 24-point type enlarged 400%.

sive PostScript laser devices. There is no technical reason why PostScript processor chips cannot be produced and cranked out like jellybeans, and the industry's experience with consumer copiers and laser printers is driving down the cost of engineering and manufacturing at an appreciable rate.

As with any business tool, however, the question is always whether one unit on the desk is worth two promised for future delivery. If you talk to anyone who has a laser printer, you'll find that few doubt the worth of going ahead right now with a purchase. The Macintosh has provided us with easy, accessible high-resolution graphics and formatted typestyles for text. It seems only right, when budgets permit, to give it an output device that brings out its best. +

Steve Rosenthal normally works upstream from the RIP and marking engine, turning thoughts and notes into text for PostScript encoding for A+ and other magazines.

PRODUCT INFORMATION

LaserWriter and **LaserWriter Plus**
Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA, 95014
(408) 996-1010
List Price: LaserWriter, $5995; LaserWriter Plus, $6798

PS 800 and **PS 2400**
Quality Micro Systems (QMS), Inc.
P.O. Box 81250
Mobile, AL 36689
(205) 633-4300
List Price: PS 800, $5895; PS 2400, less than $30,000
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Linotronic 100P and **Linotronic 300P**
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(516) 434-2000
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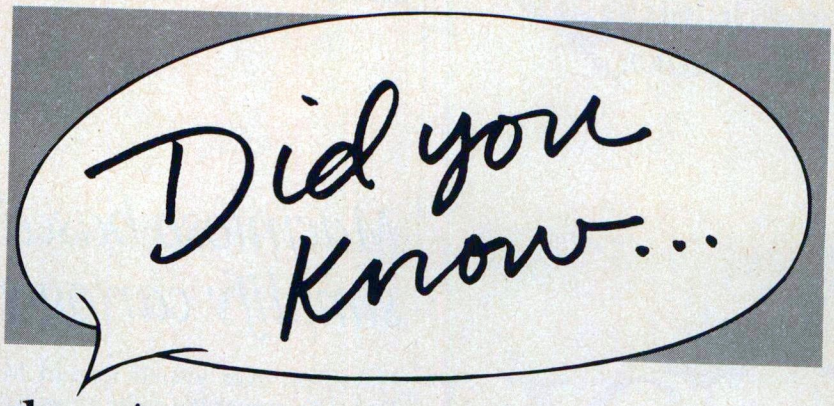

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GRAPHICS *BY CRAIG L. WEBB*

YOU CAN GET THERE FROM HERE

Macintosh-based mapping systems simplify cartographers' craft.

Have you ever visited Ranald MacDonald's grave? It's eight miles out of Curlew, along the Kettle River about—wait a second—let me draw you a map.

There really is a grave of MacDonald up near Washington state's northern border. Unlike Ronald McDonald with the like-sounding name, this MacDonald won fame for opening American trade with Japan, not for clowning around with hamburgers. My point about drawing a map still stands, though; without one, I probably would need more time to explain the grave's location than you would need to drive there. (In MacDonald's case, see figure 1).

Maps have long been valued for the way they show instantly where a place is and how it relates to the surrounding world. Not long ago, however, when the average person sent information in the form of a line of type or else not at all, there was no easy way to put a map into a report or term paper.

The Macintosh has ended that dilemma. With it, you can create all the maps you want, modifying them to meet particular needs.

Software and gadgets for a Mac-based mapping system cost anywhere between a few dollars and $2000. Most people need only clip-art packages, which range in price up to $200 and work in conjunction with programs such as MacPaint and MacDraw. More adventurous types who want to create or customize maps should consider obtaining a digitizer and/or a tablet device to replace the mouse.

Keep in mind, however, that the most important part of mapmaking is the time you spend thinking about what you want to show. Only with such planning can you assure that your map will convey the sense of place and importance that you want. (For pointers on map styling, see "Tips for Better Mapmaking," which accompanies this article.)

The No-Tools Approach

The cheapest way to make a good map on the Mac doesn't require any special tools. Instead, you need only a map, a ruler, a pen, a Mac, and MacPaint.

Take the map and draw a grid on it, with the lines about a quarter inch apart. Then start MacPaint and begin recreating what you see on the grid, box by box. The grid method will help keep you from veering out of perspective as you transfer the map's contents onto the screen.

David Riley, art director of the *Kentucky New Era* in Hopkinsville, Kentucky, has used the grid often to create maps for his newspaper (see *A+*, March 1986, pages 118–124). He also has enjoyed success with another low-cost technique that requires a copying machine and some clear plastic acetate sheets, available at most business-supply stores.

Take the map you want to recreate and put it into the copier. Then insert the acetate sheets into the tray where the copy paper normally goes. Start the machine and copy the map onto a sheet. Take the sheet home, tape it onto the front of the Macintosh screen, and start up a drawing program. Now, keeping your head very still so as not to distort the perspec-

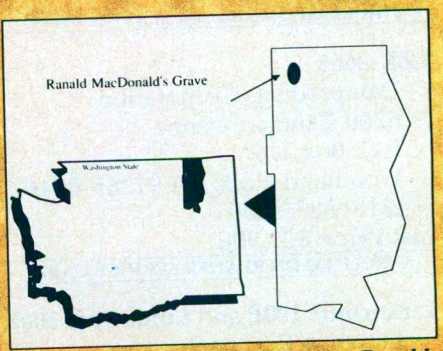
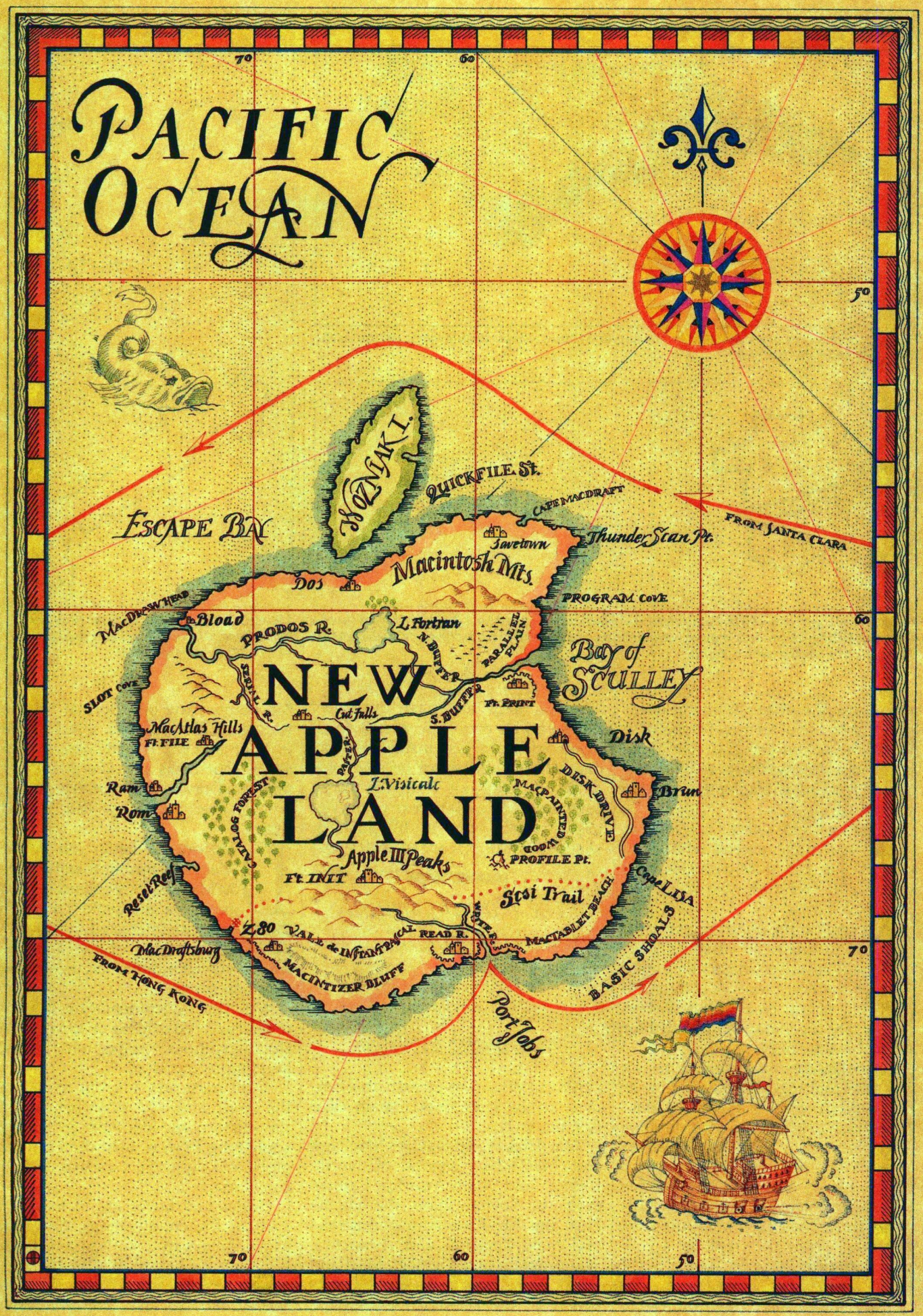


Figure 1: A Mac-made map showing Ranald MacDonald's Washington grave site

ILLUSTRATION BY RADIOMAYONNAISE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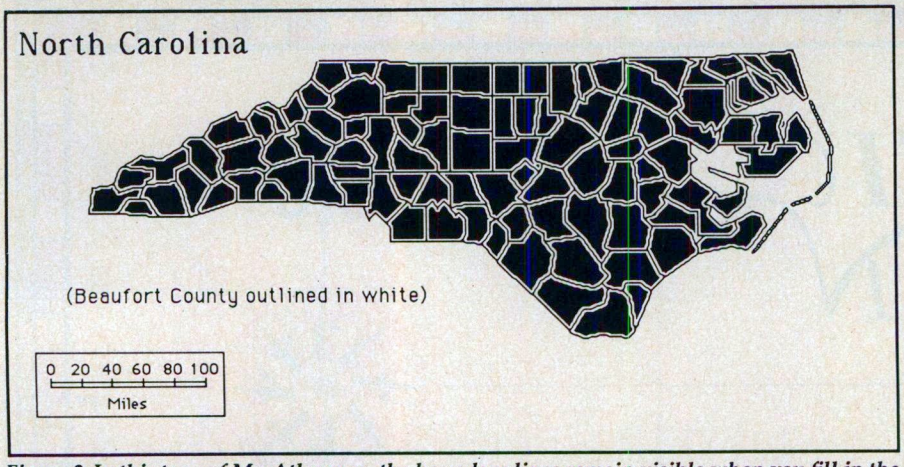

Figure 2: In this type of MacAtlas map, the boundary lines remain visible when you fill in the map with MacPaint patterns.

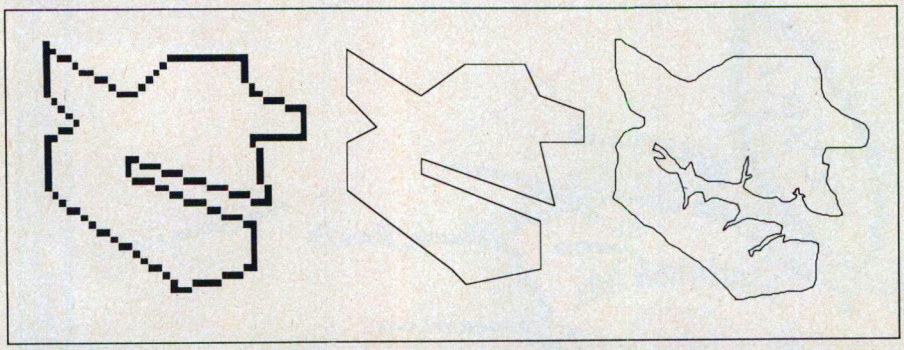

Figure 4: Enlargements of MacPaint- (left) and MacDraw-format MacAtlas maps reveal their lack of detailing. To produce a more accurate map, you need to use a professionally designed original and a tracing device (right).

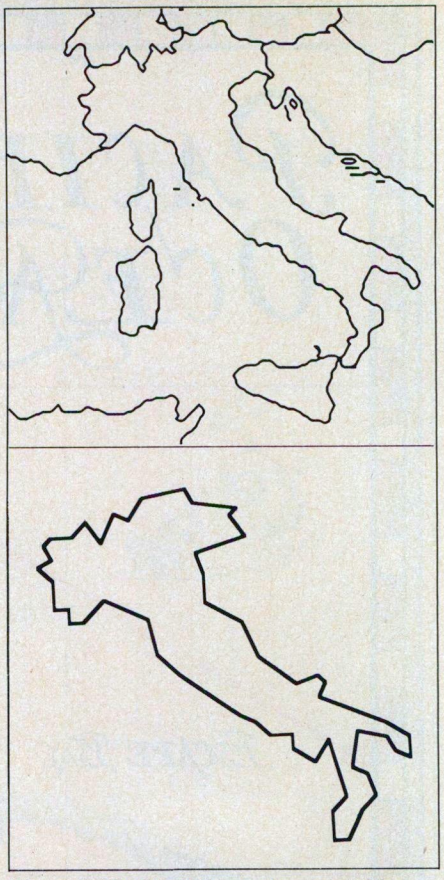

Figure 3: The MacAtlas package provides clip-art maps in both MacPaint (top) and MacDraw formats (bottom).

tive, trace the image from the clear sheet onto the screen just behind it. When the screen gets full, just move it and the acetate sheet, again being careful to avoid changing the angle of your head.

Riley's systems exact a price in patience that might exceed what they save in cash. For those who lack such serenity, the solution may be to buy clip-art software.

Several software companies include maps in their clip-art packages. For maps alone, one of the best pieces of software is MacAtlas, created by Robert Dahl, a geography specialist for the state of New Jersey.

The MacAtlas package features six diskettes that together give a view of the world in both MacPaint and MacDraw format. MacAtlas USA contains 19 maps showing the United States as a whole or in sets of states grouped by census region. The MacPaint-format maps are available in 5 × 7 or 8 × 10-inch sizes. The three MacDraw-format maps show the states on a U.S. map ranging in size from 6 × 7 inches to 16 × 20 inches.

Dahl shows his thoughtfulness in a set of maps that have the states filled entirely in black, except for a one-pixel space just inside the borders. He left this space because of a quirk in MacPaint that can cause some borders to disappear when you use the paint can to fill adjacent shapes. In the blackened states, the paint patterns never reach the borders, so the state lines remain clear (see figure 2).

The most important part of mapmaking is the time you spend thinking about what you want to show.

MacAtlas World features MacPaint and MacDraw versions of North, Central, and South America; Europe; Asia; the Soviet Union; the Middle East; the Far East; Africa; Australia and New Zealand; and Antarctica. The program also includes MacPaint but not MacDraw maps of the Caribbean and the Western Hemisphere. MacPaint is the only format for the two maps of the world, which come in 4 × 5 and 6 × 8-inch sizes. A final set of four disks provides MacPaint and MacDraw maps of every county within every state in the United States.

Dahl does a better job in the MacPaint format than he does in MacDraw (see figure 3), but both are adequate for users who are interested in just giving an idea of the area involved, rather than presenting a carbon copy.

MacAtlas' documentation is easy to read and full of ideas on how to use shadings, lines, proportional sizes, and graphs in maps.

Dahl purposely left out scales on the World and USA disks because of the distortions involved in taking something from a three-dimensional globe and putting it on a two-dimensional map.

Scales and boxes are included in each of the county maps, however. Most American counties are polygonal, so it's a snap to take the MacDraw versions and expand them to the desired size. But after you blow

There is no perfect program for creating maps. Consider using several programs to fill various needs.

up a more jagged county, such as Beaufort in North Carolina, in either MacPaint or MacDraw (see figure 4), MacAtlas gives only an impressionistic view at best. The state maps, in contrast, look good.

MacArt Library's Geography by compuCRAFT costs less than MacAtlas but offers little. It features MacPaint-only images of Africa, Asia, Europe, South America, North America, the United States, various versions of the globe, and the entire world. The package also contains digitized images of such landmarks as the Statue of Liberty, a pyramid, and Boston's Old North Church.

None of the drawings look as good as those of MacAtlas. Even if the maps were better, I still would have to dismiss the program for sloppiness. There's little excuse for producing software that misspells a country's name ("Hati" for Haiti on my disk) and identifies the same country as both Nicaragua and Costa Rica.

Advanced Tools

At some point, just about every person who needs a lot of maps will have to do them by hand. Here are two tools that can be especially handy. The first is a tracing device such as Summagraphics' MacTablet, Macintizer by GTCO Corporation, or Make Another Copy by Innovative Products. The MacTablet and Macintizer offer a version of the mouse that looks like a pen and operates on a special pad. With the special cursor-control device, usually known as a stylus, you can trace just about any map you want with far more accuracy than the usual clip art provides (see figure 4).

Make Another Copy is a mechanical device that locks the mouse into place and makes it follow the movements of a stylus. As a result, when you trace with the stylus, the mouse moves too and creates on the screen the image you're tracing.

Sometimes it's easiest to let the Mac read a map for you. With a digitizer, it can do that by scanning a map and then turning the light and dark images it sees into a series of electronic commands that it relays to the computer screen.

Some scanners operate like a television camera. The ThunderScan digitizer by Thunderware, Inc., uses a device that replaces the ribbon in an ImageWriter and scans a picture or map as if it were printing something (see "ThunderScan," *A+*, August 1985, pages 136–141). You can then touch up parts of the resultant digitized image by adjusting the contrast or brightness in specific areas (see figure 5).

I had the best results digitizing maps with lots of black and white and less success transferring maps that

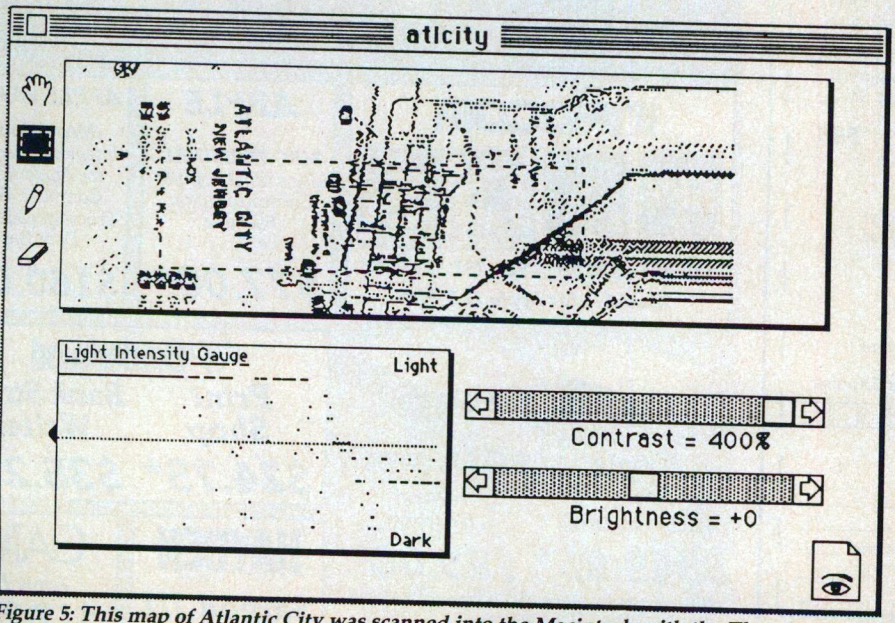

Figure 5: This map of Atlantic City was scanned into the Macintosh with the ThunderScan digitizer.

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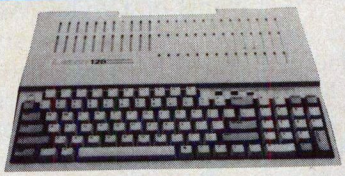

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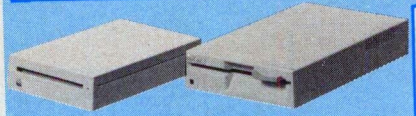

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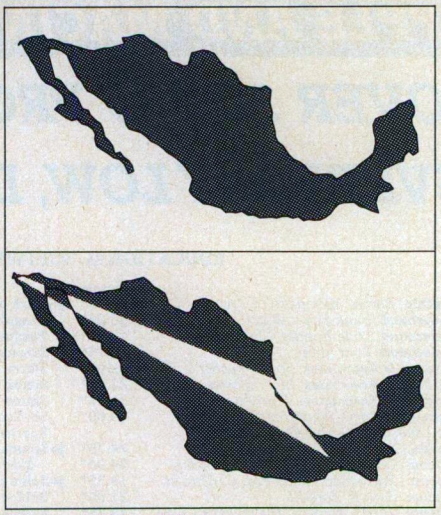


Figure 6: If you lift the stylus when you're tracing in MacDraw, your map may include unwanted lines.

used color overlays or that had been copied on dirty photocopiers.

Brian Smith, Thunderware's marketing coordinator, suggests that would-be mapmakers screen in the high-contrast mode and have the ThunderScan scan only in one direction and operate at the slowest scanning speed.

Wanted: Mapping Software

There is no perfect program for creating maps. Consider using several programs to fill various needs, just as you bring both a hammer and a saw when you head to a construction site.

MacDraft, which uses an object-oriented format similar to MacDraw's, can create straight lines while you're in the freehand drawing mode and then shift back to freehand curves and jags. This ability is particularly valuable when you're tracing states, such as Texas, that combine straight and meandering borders.

MacPaint shines brightest with FatBits and its pixel-by-pixel editing. MacPaint and page-layout programs such as PageMaker, ReadySetGo, and MacPublisher also let you crop maps in which you use only part of a larger map. Page-layout programs also generally provide extra variety in headline styles and sizes.

Drawing programs such as MacDraw take up less memory than MacPaint does and work better at the purely drafting aspects of a map—creating an eight-inch-wide circle for the border, for example.

Now for the MacDraw drawbacks. One of the most frustrating moments can occur after you've traced a map

outline with a tablet and happened to pick up the stylus once or twice. When you try to fill that map, bizarre lines suddenly appear and the map becomes as abstract as a Joan Miro painting (see figure 6).

What happened is that each time you stopped tracing a freehand line in MacDraw or MacDraft, the program automatically turned the creation into a polygon by drawing a line between the two ends. That line exists even if you draw with the No Fill command on and if you continue your freehand drawing so that you start where you originally began.

If you want to give your next mapping job a sense of adventure, you could use the charts that CIA operatives use.

The only simple ways to avoid the problem are either to forget using a fill on the drawing, create the map in MacPaint, or figure out how to trace the map without stopping until you get back to where you began the tracing.

The MacTablet and Macintizer help alleviate the problem by offering an option that reads your tracing movements and reduces them up to 50%, which means you can take a map that's twice as big as the screen and trace it. Another bonus is that you get twice the accuracy for half the space. Another alternative is to find a copier that can make reduced copies of the map you want to trace. Keep reducing it until the entire map fits on the screen.

QuickDraw systems also can be a problem when you're handling type, because words do not shrink when you reduce a drawing. In addition, you can't rotate words and bit-mapped graphics in MacDraft, as you can with an ordinary line or polygon.

The Future

Most people no doubt will be happy tracing their maps out of a handy road atlas. But if you want to give your next mapping job a sense of adventure, how about using the charts that James Bond's American buddies use?

Tips for better MAPMAKING

The difference between good and bad maps has less to do with craftsmanship than with intent. That's why mapmakers' first task is to think about what they need to say and what the best ways are to get the message across.

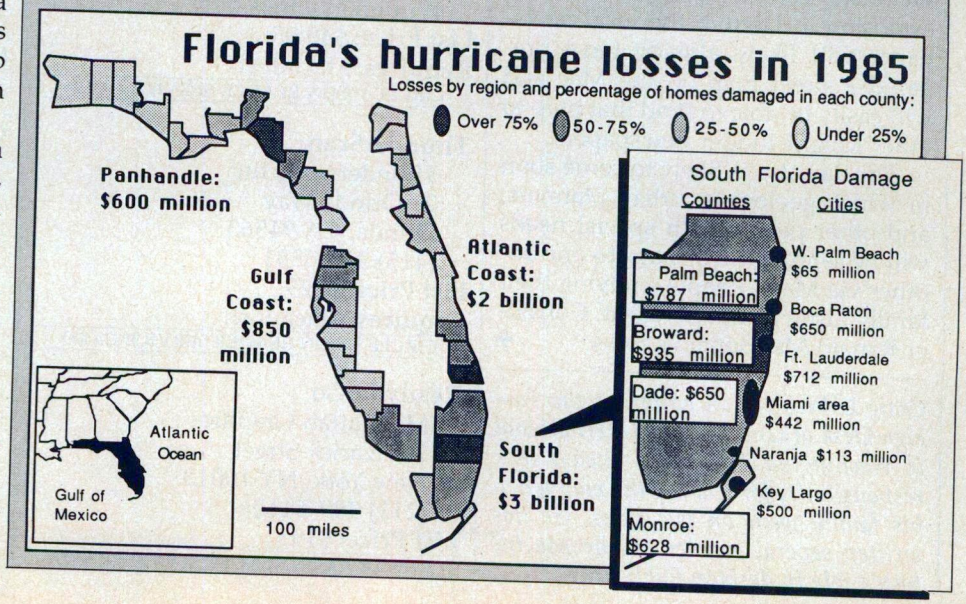
The documentation for the MacAtlas series provides dozens of ideas on creating good maps. Here are some more, culled from talks with graphic artists at United Press International who have created hundreds of maps in the past year:

- Consider your readers' geographic IQ. Most Floridians, for example, know what their state looks like and that it dangles off the southeastern edge of the United States. Many Italians, however, can spot Florida on a map only about as easily as the typical American can point out the province of Lazio on the Italian boot. So when you create a map, either include surrounding states to give a point of reference or put a smaller map in a corner showing the subject area's place in the world.
- Several small maps, or maps that blow up other maps, often do a better job of telling your message than one big map does.
- Give your map a three-dimensional look by having part of the map stick out a bit from the surrounding box or by putting a shadow underneath the map. In general, the shadow should be on the same side as the main part of the map, thus helping lead the readers' eyes into the body of the drawing.
- Include a scale, so readers get a sense of perspective.
- If you want a headline, make it big—at least 30 or 36 points. Put it near the top.
- Put body copy as near as possible to the headline.
- Maps are assumed to lie on a north–south axis unless otherwise indicated. If you tilt the map's direction, include a north arrow.
- Keep it simple.

All this advice figured into my attempt to create a map for UPI describing hurricane losses in Florida, particularly South Florida, during 1985 (see Florida map below). It was designed for Americans and thus has a locator map showing the southeastern United States.

Had this map been intended for Latin American clients, I probably would have shifted the small map to show Florida in relation to Central America and the Caribbean. And if I had wanted to send it to Europe, I would have put in a map of the entire United States.

One of the best ways to learn to create better maps is to see how newspapers and magazines do it. Among the best at the art are *Time* magazine, *National Geographic*, *USA Today*, *The New York Times*, the *Dallas Times Herald*, and the *Seattle Times*.



Central Intelligence Agency operatives, for obvious reasons, need high-quality maps. Over the years, the CIA has charted the Earth and converted all the data into vectors that fit on a set of five mainframe-style, 2400-foot, half-inch computer tapes collectively known as World Data Bank II. Now, for $760 for the set, the agency is selling a declassified version of those maps.

A Washington, D.C., company named Azimuth has been working to format the data so it will fit in with its mapping system, which lets you see the Earth from any height, any angle. Azimuth programmer Richard Furno says he expects to have most of the formatting done by the end of this summer.

Stuart Weisman, product manager at the U.S. National Technical Information Service, the company that handles World Data Bank II, says the tapes contain about 150 megabytes of data. He adds that his group is examining the possibility of putting the data onto laser disks.

For those who can't wait, the CIA now sells print versions of its maps, some at scales as accurate as one inch for every 15 miles. Uncle Sam also has maps available through such groups as the Census Bureau, the Defense Mapping Agency, and the U.S. Geological Survey.

Maps also are the kinds of things that users' groups in far-flung sections of the country can easily share. Newspaper chains such as Knight-Ridder already have set up networks in which each member paper can pick up maps and charts created by other members. For example, if there is an explosion in Detroit, the local newspaper will likely already have prepared a street map on the Mac and will easily be able to send that map to other Knight-Ridder newspapers.

The day also is likely to come soon in which geologists, urban planners, and other people with special needs will be sending their maps to one another via Macs. People studying their family history can also use it. Consider Ranald MacDonald's folks. ✚

Craig L. Webb is an editor on the Foreign Desk at United Press International in Washington, D.C., who always took responsibility for reading the map when his family went on vacations. He has written several articles on the Macintosh's role in desktop publishing.

PRODUCT INFORMATION

MacAtlas
Micro:Maps
Box 1353
Morristown, NJ 07960
(201) 658-4333
List Price: MacAtlas USA and World, $79; Counties set, $119; all six diskettes, $199; demo disk, $9
Requires: Macintosh, 512K RAM or second disk drive, MacPaint or MacDraw
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Mac-Art Library: Geography
compuCRAFT
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Englewood, CO 80155
(303) 850-7472
List Price: $29.95
Requires: Macintosh
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MacTablet
Summagraphics Corporation
777 State Street Extension
Fairfield, CT 06430
(203) 384-1344
List Price: $395
Requires: Macintosh
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Macintizer
GTCO Corporation
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Rockville, MD 20850
(301) 279-9550
List Price: $599
Requires: Macintosh
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ThunderScan
Thunderware, Inc.
21 Orinda Way
Orinda, CA 94563
(415) 254-6581
List Price: $229
Requires: Macintosh
CIRCLE 373 ON READER SERVICE CARD

ReadySetGo
Manhattan Graphics
163 Varick Street
New York, NY 10013
(212) 989-6442
List Price: $195
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MacDraft
Innovative Data Design, Inc.
1975 Willow Pass Rd., Suite 8
Concord, CA 94520
(415) 680-6818
List Price: $239
Requires: Macintosh, 512K RAM
CIRCLE 375 ON READER SERVICE CARD

PageMaker
Aldus Corporation
411 First Avenue South, Suite 20
Seattle, WA 98104
(206) 622-5500
List Price: $495
Requires: Macintosh, 512K RAM, external disk drive
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MacPaint/Draw
Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
List Price: MacPaint, $125; MacDraw, $195
Requires: Macintosh

MacPublisher
Boston Software Publishers, Inc.
19 Ledge Hill Road
Boston, MA 02132
(617) 267-4747
List Price: Publisher I, $99.95; Publisher II, $195
Requires: Macintosh
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World Data Bank II
National Technical Information Service
Software Division
5285 Port Royal Road
Springfield, VA 22161
(703) 487-4600
List Price: Volumes 1–5, $760
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Government maps
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U.S. Government Printing Office
Washington, DC 20402
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Strategic Locations Planning
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San Jose, CA 95117
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Requires: Macintosh and Filevision
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MacTips

Suggestions from our readers

MAKING FULLPAINT WORK WITH SWITCHER

I recently received a copy of Ann Arbor Softworks' FullPaint (Version 1.0) and discovered that its programmers had made a small mistake. The FullPaint manual says that the program requires a 384K partition to run under Switcher, but Switcher automatically assigns a too-small 376K (if there is not enough memory to assign the preferred 512K) when you load FullPaint into Switcher. Using ResEdit, the resource editor from Apple, you can fix FullPaint so it works properly with Switcher.

Insert a copy of your FullPaint disk (not the original!) into your Mac and a disk containing ResEdit into your external drive. After you double-click on the ResEdit icon, two windows will appear, one for the ResEdit disk (1) and the other for the FullPaint disk (2)—the numbers in parentheses refer to areas of figure 1 labeled with circled numbers. Double-click on FullPaint in the **FullPaint™** window, which makes another window (3), labeled **FullPaint**, appear. Here, you should double-click on SIZE. Yet another window (4) will appear, called **SIZEs from FullPaint**. Double-click on SIZE ID = –1. Finally, the window (5) labeled **SIZE ID = –1 from FullPaint** will appear. Scroll to the bottom of this window, where you'll see a text box labeled Min size.

The number in the Min size box represents the minimum amount of memory the program requires in order to work under Switcher. This number tells Switcher how big a partition to set aside for FullPaint. Most new programs have Size resources. Older programs may require more than the default 128K, but you have to configure them manually. With a Size resource, the computer does it automatically. Switcher tricks the program into thinking it's running in 512K.

When I first looked at the Min size number, I was a little confused, but then I remembered that 1K actually equals 1024, not 1000. Dividing 352,256 by 1024, you get 344K, which is considerably less than both 376K or 384K. I looked at the Size resources of some other programs, however, and found that this number was consistently 32K smaller than it should have been. [32K is the amount of memory the System and the screen require.—Editors] If you want the Min size to equal 384K instead of 376K, you must actually subtract 32K from 384K. Then you multiply the result (352K) by 1024 and get 360,448. Thus, the Min size for FullPaint should read 360448, not 352256.

Change Min size to 360448 and close all the windows. When ResEdit asks you if you want to save FullPaint, click on Yes. When the FullPaint disk pops out of the computer, you're ready to go. Note that if you're clever, you can actually use ResEdit to add Size resources to programs that don't already have them.

Cleland E. Early, Jr.
Pasadena, TX

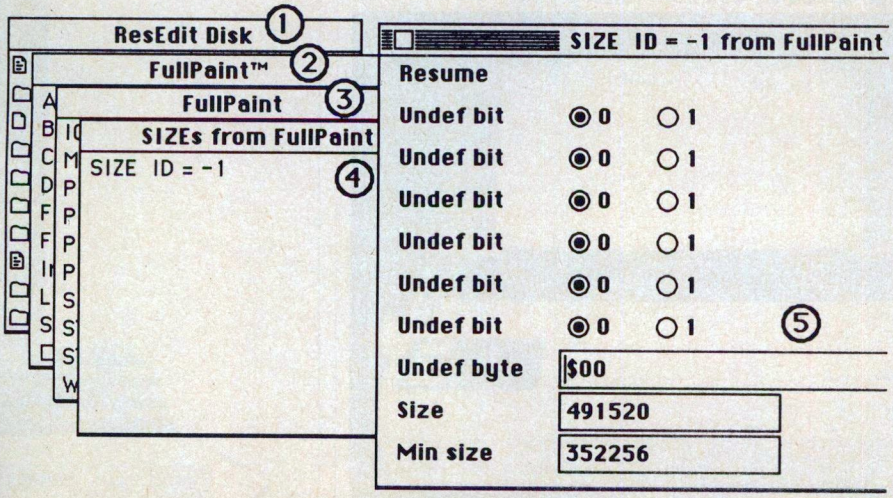

Figure 1: The FullPaint and ResEdit windows you use to fix FullPaint to work with Switcher

EXCEL AND WINDOW OPTIONS

If you want to enter the same formula in several cells, simply select the cells into which you want to enter the formula and then, while holding down the Option key, press the Enter key. The formula will appear in all those cells, which means you don't have to go through the copy/paste routine. Control; enters the current time, and Control- enters the current date. In many dialog boxes with check boxes, you can toggle any selection by typing the first letter of its label. For instance, in the Style dialog box, if you want boldface type, press B, and if you want to turn the boldfacing off, type B again.

In order to close all the open windows on the desktop, simply hold down the Option key and click on the close box on the first window; the rest of the windows will automatically close.

David L. Hoefer
Newfane, VT

Pipeline

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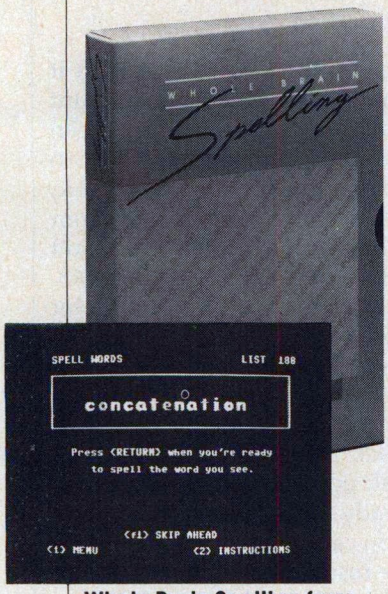

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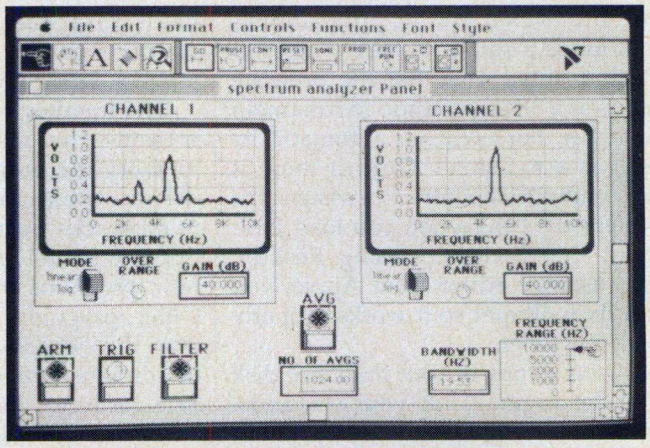

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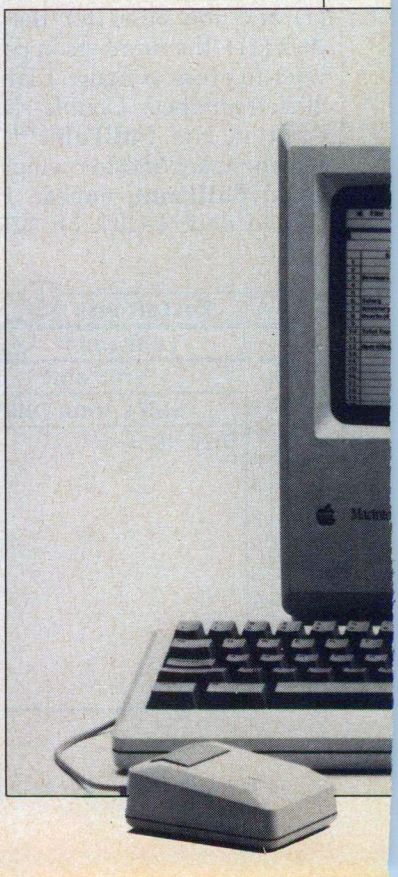

instruments. A virtual instrument consists of a front panel for interactive operation; a block diagram that shows data flow from input controls, through internal processing functions, to output display terminals; and an icon that allows programmatic use in block diagrams of higher-level virtual instruments. The system comes with a complete library of built-in functions. *(List Price: $1995)*

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AST Research, Inc.
2121 Alton Avenue
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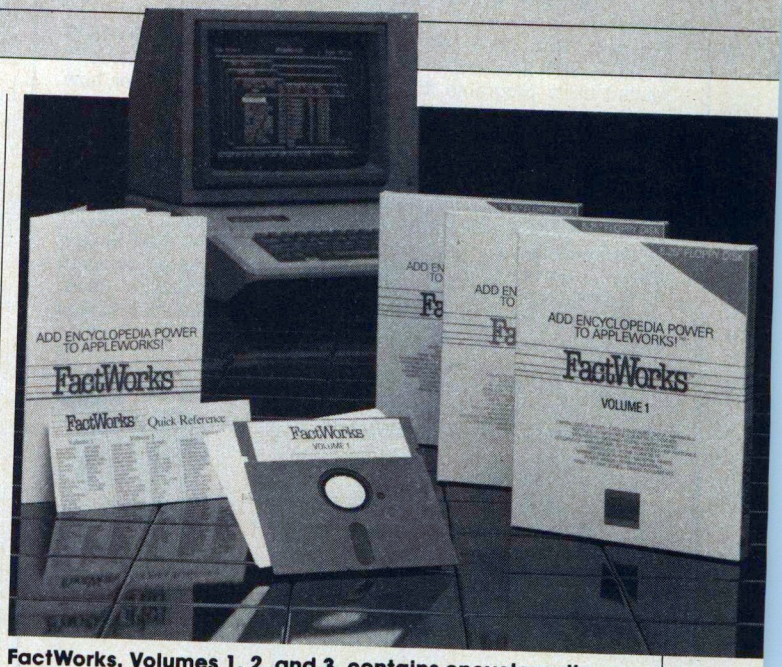

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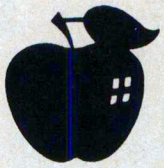

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HARDWARE

OKIMATE PRINTER

The Okimate 20 color thermal-transfer printer includes an appropriate Plug 'N Print module that can connect the printer to Apple, Commodore, or Atari computers. The Plug 'N Print kit includes a data cable, color and black cartridge ribbons, sample paper, and complete instructions. The printer can print more than 100 colors, and its 24-element printhead provides correspondence-quality print at 80 cps in standard mode and 40 cps in near-letter-quality mode. It can print 80 standard columns or 132 columns of condensed type. Users can select several type fonts and produce underlining, superscripts, and subscripts. *(List Price: $268)*

Requires: Apple IIe or IIc

Okidata
532 Fellowship Road
Mt. Laurel, NJ 08054
(609) 235-2600

CIRCLE READER SERVICE NO. **505**

PLUS PLUS

Micro Conversions' Plus Plus, a memory upgrade for the Mac Plus, doubles the computer's capacity to 2 megabytes of fully linear, random-access memory, maximizing the machine's speed and power for all types of applications. *(List Price: $649)*

Requires: Macintosh Plus

Micro Conversions, Inc.
1900 E. Randol Mill Road
Suite 103
Arlington, TX 76011
(817) 860-2291

CIRCLE READER SERVICE NO. **506**

MicahDrive 20 AT, a 20-megabyte, internal hard disk for the Mac

MICAHDRIVE 20 AT

MICAH has announced a $200 price reduction for its MicahDrive 20 AT, a 20-megabyte internal hard disk for Macintosh computers. The product includes a proprietary internal interface that transfers data to and from the computer's RAM memory at 0.625 megabytes per second. Installation is easy and involves clipping the disk to the Macintosh's main logic board. HFS, Apple's file-management software, comes bundled with the unit; each disk also has software that allows existing non-HFS-compatible programs to run. Each package comes with archival/restore software that lets users back up an entire hard disk or back up by file, directory, wild-card match, or the time the file was created. *(List Price: $1695)*

Requires: Macintosh, 512K RAM

MICAH, Inc.
2330 Marinship Way
Suite 111
Sausalito, CA 94965
(415) 331-6422

CIRCLE READER SERVICE NO. **507**

Interlude II

MATA HARI—Interlude #156

What time does your flight arrive?

Oh, are you picking me up?

Look for a tall brunette in a trenchcoat... and nothing else.

Ah, you've been playing Interlude again!

Right.

Maybe I can catch an earlier flight.

Please do.

Interlude II. The long-awaited sequel to the first adult computer game in history is finally here. It's provocative and playful! Outrageous and romantic! It has all the excitement of the original Interlude, plus significant new features.

The computerized interview, which is taken by one or both players, has been greatly expanded. It probes your innermost desires to discern your mood of the moment, your secret longings, your special fantasies, and then suggests for your pleasure one of its more than 160 Interludes. You can ask the computer for an Interlude for now, or one for later. Special options give each player added control over surprises and special erotica hidden in the Interludes.

The original Interlude took the computer world by storm six years ago, creating a media sensation:

FORUM Magazine: *"The Interludes are imaginatively and sensitively written... the computer's recommendations are uncannily appropriate."*

US Magazine: *"The most edifying third party to join couples between the sheets since* The Joy of Sex."

Chicago Tribune: *"This marriage of computer technology and sex is natural... erases forever the image of computer-users as dull guys with slide rules in their pockets and square roots on their minds."*

Money Magazine: *"Sometimes it's easier to tell a computer what you want than it is to tell your partner."*

Interlude II will take you to the outer limits of fantasy and romance. And, if the computer selects Interlude #99 your love life may never again be the same.

Interlude II. Are you ready for it?

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Recreational Technology, Inc., 11011 Richmond, Suite 600, Houston, TX 77042

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1-800-752-7001 ext. 829
(in Texas call 1-800-442-4799 ext. 829)

Available for Apple II, II+, IIc and IIe.[1]

[1]Trademarks of Apple Computer, Inc.

$39.95 Interlude II

_____ Shipping $3.00 (outside U.S.A. $10.00)

_____ TX residents add 6⅛% sales tax ($2.45)

$ _____ TOTAL

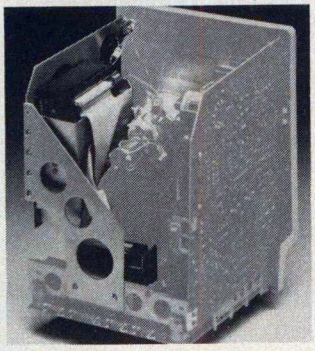
A+

Pipeline

MAC

PRODIGY 4

A high-performance enhancement for Macintosh computers, the Prodigy 4 is an internal upgrade board that clips onto the computer's motherboard. The upgrade board contains a high-end 68020 microprocessor; a 68881



Prodigy 4, a high-performance, internal upgrade board

floating-point math co-processor; 4 megabytes of contiguous RAM; and an enhanced, on-board SCSI port. The 68020 has a 16-MHz clock and 32-bit data path and runs at double the speed and fetches twice as much information as the Macintosh's 68000. Standard software can run 4–5 times faster on the Prodigy, and programs that optimize the floating-point chip can run up to 100 times faster than they can on a standard Macintosh. *(List Price: $7000)*

Requires: Macintosh

Levco
6160 Lusk Blvd.
Suite C-203
San Diego, CA 92121
(619) 457-2011

CIRCLE READER SERVICE NO. **513**

NL-10 PRINTER

Star Micronics has introduced the NL-10, a nine-wire, dot-matrix desktop printer designed for professional, small-office, and home use. The NL-10 prints high-speed draft quality at 120 cps and near letter quality at 30 cps. Its front panel contains push-button controls for 11 format and print functions, including 3 print-pitch selections, typestyle, print mode, margin settings, and forward and reverse micro paper feed. A standard, adjustable, rear tractor feed provides a quick-tear feature that reduces paper waste and saves time realigning paper between jobs. An automatic paper feed loads single sheets into the printing position. Automatic single- and dual-bin, cut-sheet feeders are available as options, and plug-in interface cartridges are available to ensure compatibility with most popular computers. *(List Price: base unit, $319; NL-10 with one interface cartridge, $379; cartridge, $60)*

Star Micronics' NL-10 dot-matrix desktop printer

Star Micronics, Inc.
200 Park Avenue
Suite 3510
New York, NY 10166
(212) 986-6770

CIRCLE READER SERVICE NO. **514**

MAC

PROFESSIONAL SERIES TABLET

Summagraphics has released the Professional Series, a graphics tablet with a full 18 × 12-inch active

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A+ would appreciate receiving any tips, hints, shortcuts, or suggestions that you have for using the Macintosh computer. We would like to publish these pearls in our MacTips feature in our Macintosh section. You'll receive credit in the magazine, and we'll pay $50 for each MacTip that we use. Send your tips to:

MacTips
A+ Magazine
ATTN: Chip Carman
11 Davis Drive
Belmont, CA 94002

area, for Macintosh computers. Designed particularly for use with CAD graphics packages, the tablet has a resolution of 1000 lines per inch, and its active area can accommodate a B-size drawing or two A-size sheets of paper. It comes with an interface cable, stylus, four-button cursor, power supply, documentation, and a disk that allows installation of the tablet's driver for use with Macintosh software. *(List Price: $995)*

Requires: Macintosh

Summagraphics Corp.
777 State Street Extension
Fairfield, CT 06430
(203) 384-1344
CIRCLE READER SERVICE NO. **515**

SOFTWARE

II SERIES

MUSICPRINTER

MusicPrinter allows musicians, copyists, and teachers to write complex musical notation on Apple II computers. You can use a one- or two-keystroke entry system and can control the exact placement of a full range of musical characters. The program has its own word processor with three font styles for inserting words into choral music, writing comments on the score, or writing accompanying texts. It also has full and rapid editing, deleting, justifying, disk-filing, and printing functions. Users can print music in three styles—normal, compressed, or emphasized—and printed results are suitable for publication. *(List Price: $149)*

Requires: Apple II, II Plus, IIe or IIc; 48K RAM

Temporal Acuity Products, Inc.
300 120th Avenue NE
Building 1, Suite 200
Bellevue, WA 98005
(800) 426-2673
In WA, AK (206) 462-1007
CIRCLE READER SERVICE NO. **516**

MAC

SPRINGBOARD SOFTWARE

Early Games for Young Children and Easy as ABC, two of Springboard Software's learning games for children, are now available in versions for Macintosh computers.

Intended for 2½- to 6-year-olds, Early Games for Young Children features eight games that teach children such basic skills as how to add and subtract numbers, recognize shapes and letters, say the alphabet, type with the computer, and spell their own names.

For 3- to 6-year-olds, Easy as ABC contains five games designed to teach children to identify letters, put them in alphabetical order, and match uppercase and lowercase. The program uses jumping frogs, buzzing bees, and soaring rockets that are displayed in high-quality graphics.

Both programs offer multiple skills levels, and the Macintosh versions offer picture and pull-down menus with keyboard commands for quick selections and the ability to print screens. *(List Price: $49.95 each)*

Requires: Macintosh

Springboard Software
7808 Creekridge Circle
Minneapolis, MN 55435
(612) 944-3915
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Label Express software is available for IBM/PC (LSM-I) and Apple IIe (LSM-A) computers, at $49.95 each. Its powerful features include: ☐ **Creating your own label formats, up to 180 characters on five lines.** ☐ Full-screen editing with popular, word processing commands ☐ Immediate indexing for each new entry ☐ Extensive and time-saving search features ☐ Full combine/merge capability ☐ Customized printing up to 999 copies.

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Pipeline

MEGAHAUS SOFTWARE

Megahaus has released two new programs—ReportWorks and ThinkWorks—in its line of enhancement programs for AppleWorks. Also available is DemoWorks, a package of demonstration disks and documentation for ReportWorks, ThinkWorks, and MegaWorks—a mail-merge and spelling-checker enhancement for AppleWorks. All programs feature the AppleWorks card-file interface and easy-to-use commands.

ReportWorks lets users import data from AppleWorks database and spreadsheet files to create reports, tables, and lists and to fill out full-page forms. It adds math, file-lookup, and sorting abilities to AppleWorks' reporting features.

For use by itself or with AppleWorks, the outline processor ThinkWorks lets users construct, rearrange, expand, and collapse outlines; search and replace text; and type in paragraphs for any entry. It uses standard outline labeling and indents each level of the outline automatically. Users can merge outlines into each other and can save portions of outlines for later use. *(List Price: ReportWorks, ThinkWorks, MegaWorks, $125 each; DemoWorks, $10)*

Requires: Apple IIe or IIc, 128K RAM, one disk drive, AppleWorks

MegaHaus Corporation
5703 Oberlin Drive
San Diego, CA 92121
(619) 450-1230

CIRCLE READER SERVICE NO. **518**

UNIDOS

A patched version of DOS 3.3 for the 800K UniDisk 3.5 disk drive, UniDOS lets the UniDisk 3.5 function as a dual 400K disk-drive system while users work with DOS 3.3 programs and data. UniDOS can also operate 5¼-inch disk drives at the same time, allows users to copy programs and files from 5¼-inch to 3.5-inch disks, and works with Apple RAM extension cards and compatibles. *(List Price: $35)*

Requires: Apple IIe or IIc, UniDisk 3.5

Meacom
P.O. Box 272591
Houston, TX 77277
(713) 526-5706

CIRCLE READER SERVICE NO. **519**

GRAMMAR GREMLINS

A comprehensive grammar program for elementary-school students, Grammar Gremlins presents grammar rules with more than 700 practice examples and sentences. The program covers abbreviations, subject/verb agreement, capitalization, contractions, parts of speech, plurals, possessives, punctuation, and sentence structure. It features an easy-to-use editor, animation, color, optional sound effects, and record-keeping and printout abilities. *(List Price: $49.95)*

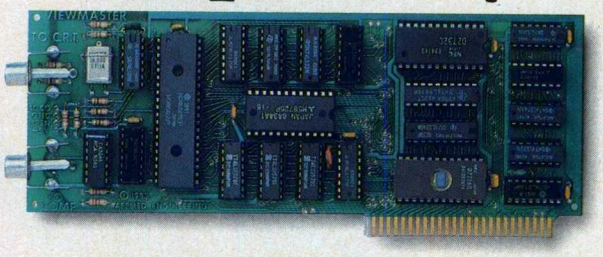
Requires: Apple II Plus, IIe, or IIc

Davidson & Associates
3135 Kashiwa Street
Torrance, CA 90505
(213) 534-4070

CIRCLE READER SERVICE NO. **520**

Viewmaster 80

Now run AppleWorks™ on your II+ *and* keep full 80 column compatibility!



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SUPRTERM		✓					✓	✓	
WIZARD 80					✓		✓	✓	
VISION 80	✓	✓			✓				
OMNIVISION		✓					✓	✓	
VIEWMAX 80	✓	✓			✓			✓	
SMARTERM	✓	✓				✓	✓		
VIDEOTERM		✓	✓		✓	✓		✓	

One look at the chart will give you some of the reasons there's only one smart choice in 80 column cards for your Apple. But the real secret to Viewmaster 80's success is something even better: Total compatibility.

Each Viewmaster 80 includes our powerful AppleWorks expand software, allowing AppleWorks to run on the II+ with only 64K (or more) memory. (We recommend the RamFactor memory card, but any compatible Apple memory card will work.) The software provides our full range of AppleWorks enhancements, including expanded records, word processor, multi-disk saving, time and date display on screen with any PRO-DOS clock, and more!

The Viewmaster 80 works with all 80 column applications, including DOS 3.3, PRO-DOS, CP/M, Pascal, WordStar, Format II, Applewriter II, dBase II, Visicalc, Multiplan, and *hundreds* of others—including AppleWorks.

Here are just a few of the powerful features the Viewmaster 80 delivers for a great price ($139):
• 80 Characters by 24 lines • Fully compatible with all Apple languages and software • Highest compatibility with existing 80 column software • Very low power consumption • High speed (18 MHZ) scroll rate • Upper and lower case characters and true descenders, both inverse and normal; all on-screen editing functions are supported • User-definable cursor shape • Compatible with Apple II, II+ and IIe • Five-year warranty

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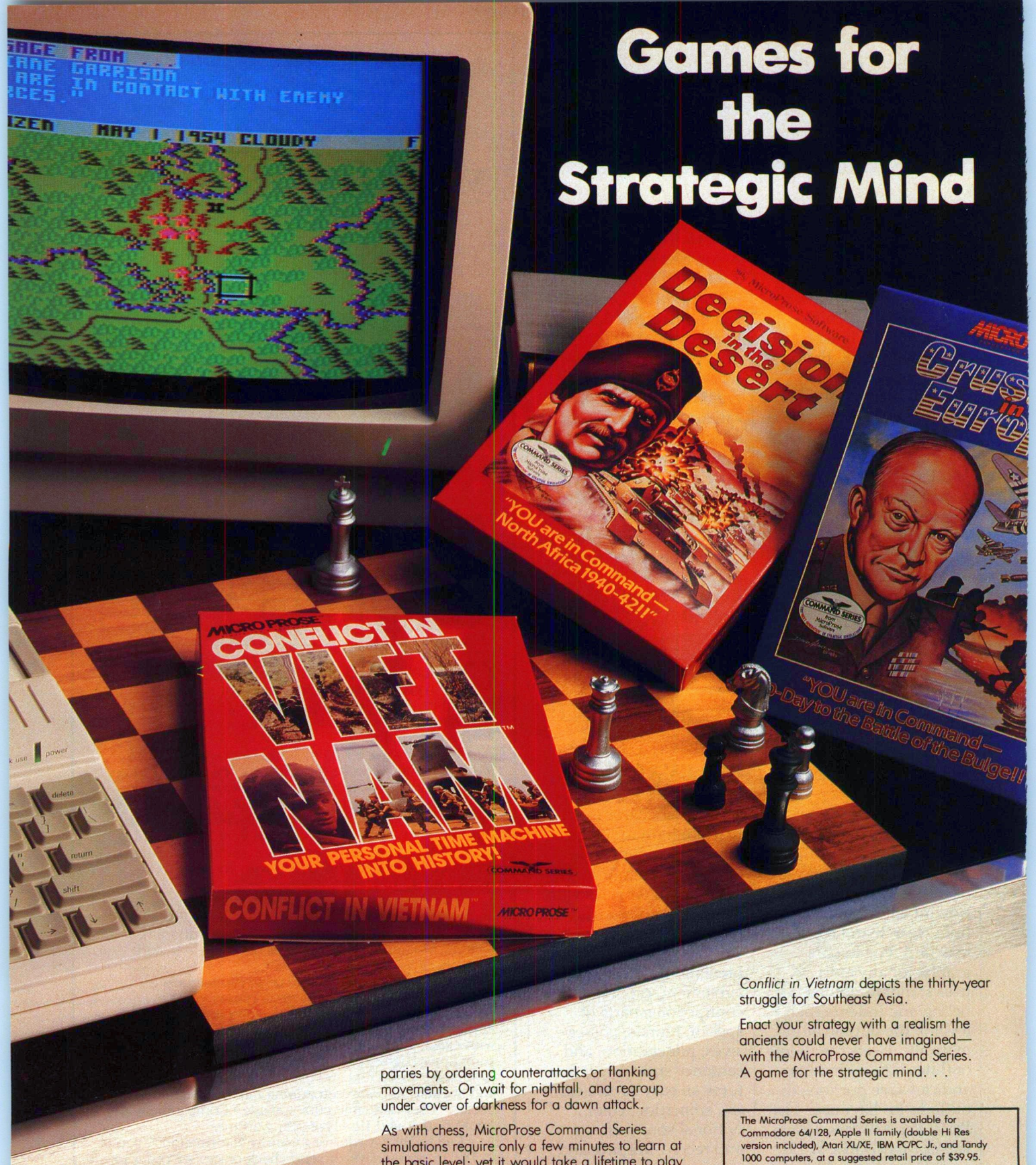

For three thousand years, men of intellect have played chess as a means of studying the acquisition of power. Now the power of the personal computer and the genius of MicroProse provide an excitingly authentic way to sharpen strategic skills—in accelerated realtime warfare on the battlefields of Europe, North Africa, and Southeast Asia. Deploy infantry, armored vehicles, or even guerrilla units, then support your troops with artillery or air strikes. Study the terrain features of the great battlefields of history. Factor in supply shortages, weather, and troop morale. As terse combat messages flow into headquarters, respond to the enemy's thrusts and parries by ordering counterattacks or flanking movements. Or wait for nightfall, and regroup under cover of darkness for a dawn attack.

As with chess, MicroProse Command Series simulations require only a few minutes to learn at the basic level; yet it would take a lifetime to play out every possible scenario. Program variations permit you to change sides and view the battle from the enemy's perspective, or to alter the balance of forces the generals actually faced. Detailed documentation provides a historical overview, and simple combined joystick/keyboard control of troop movements implements your orders.

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The MicroProse Command Series is available for Commodore 64/128, Apple II family (double Hi Res version included), Atari XL/XE, IBM PC/PC Jr., and Tandy 1000 computers, at a suggested retail price of $39.95.

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Available from your local retailer. Or call or write to MicroProse Software directly for futher information and Mastercard/Visa orders.

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MAC

MYDISKLABELER

Version 2 of myDiskLabeler lets users design and print high-quality, removable labels for 3.5-inch disks. Users can use application icons and modify them or create their own using the Icon Editor or MacPaint. Seven windows let users edit text and graphics. The software reads and sorts directories and saves labels for easy updating; it also supports Apple's Hierarchical Filing System. Users can print single or multiple labels with an ImageWriter printer. Also available is a Color Option version that lets users design and print color labels with the ImageWriter II. The package comes with 54 die-cut Smart Labels. *(List Price: $44.95, $54.95 for Color Option version; Smart Labels, $5–$18 per refill pack)*

Requires: Macintosh, ImageWriter I or II

Williams & Macias Microcomputer Products
Spokane International Airport Business Park
P.O. Box 19206
Spokane, WA 99219
(800) 752-4000

CIRCLE READER SERVICE NO. **521**

II SERIES

TICKET TO PARIS

The simulation program Ticket to Paris combines realistic travel experience with mystery and adventure, providing authentic dialogues and true-to-life situations. Players assume the role of a traveler who flies to Paris to trace a lost cousin. While in Paris they book hotel rooms, order food from menus, visit the Louvre, shop in Gallerie Lafayette, change dollars, and walk around the city. They also follow clues that may lead to the lost cousin and in doing so learn about French everyday life, food, art, history, and places to see. *(List Price: $39.95)*

Requires: Apple IIe or IIc, 128K RAM

Blue Lion Software
P.O. Box 650
Belmont, MA 02178
(617) 489-2477

CIRCLE READER SERVICE NO. **522**

II SERIES

MAGIC MUSIC TEACHER

Designed for special education, Magic Music Teacher offers special switch input for physically disabled students and speech-synthesis output for those who are visually impaired. Users can operate the software using one or two switches—for example, buttons on a KoalaPad or joystick or two keyboard keys. An Echo/Cricket! voice synthesizer can provide speech output. The program offers four games that provide Suzuki-style activities—Magic Melody, Magic Rhythm, Advanced Melody, and Advanced Rhythm. The games help students develop such skills as auditory discrimination, sequencing, listening, and hand-eye coordination. *(List Price: $69.95)*

Requires: Apple II Plus, IIe, or IIc; 64K RAM

Educational Software Review
1400 Shattuck Avenue
Suite 774
Berkeley, CA 94709
(415) 528-2788

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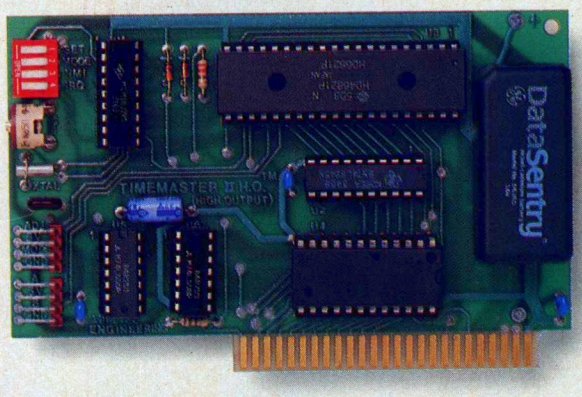

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Timemaster H.O.	**$129.00**
BSR option (may be added later)	**$ 39.00**

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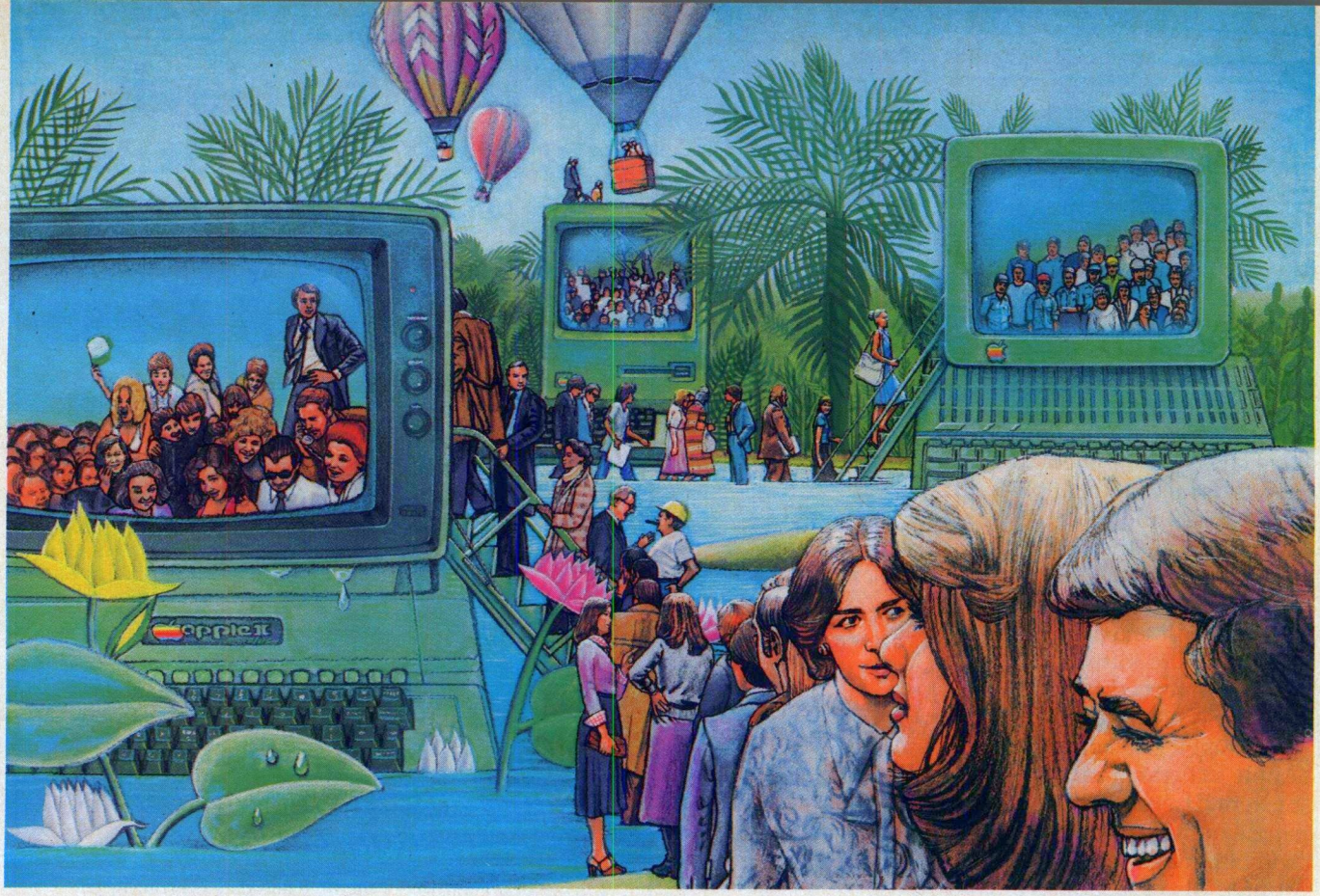

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Requires: Apple II Plus or IIe

Electronic Courseware Systems, Inc.
1210 Lancaster Drive
Champaign, IL 61821
(217) 359-7099

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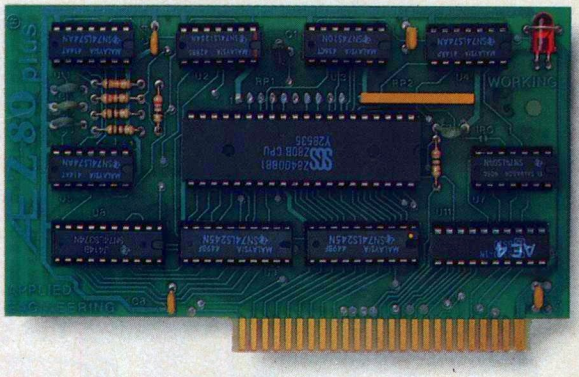

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BY STEVE ROSENTHAL

GETTING ORGANIZED ON DISK

Ways to find your way through a thicket of information

Whether it's 4 or 10 o'clock, do you know where every one of your files is? Even though computers are supposed to be good at keeping track of things, that natural talent alone isn't enough to keep most of us from losing track of our program and data files with some regularity. Keeping abreast of what information is in what file and which file is located on which disk isn't easy. Getting even close to doing so requires cooperation between us and the machine.

That isn't to say that an Apple II or Mac in normal use will actually scramble the location information that each records on its diskettes as the disk directory. Although program bugs or hardware failures can corrupt this information, such problems aren't usually the major headache.

Rather, the difficulty is that even small personal computers can now store and work with such large amounts of information in such a multiplicity of files that we can grasp the sum total only in smaller parts. We then have to combine the smaller parts in some logical and understandable way to make up the big picture.

Furthermore, although computers generally search through lists far faster and more accurately than do people, searching is still a relatively slow task, one that can take much longer for long lists than for short ones. (This slow pace is due partly to the processing time, but mostly it has to do with the need to move segments of the list being searched into and out of the disk). Even computers benefit by dividing information into categories and searching through only the relevant classifications.

The Evolutionary Tree

Apple's early operating systems have felt the burden of this increasing search time for both machine and user, and each has evolved toward a solution also common to most non-Apple systems: The list-structured DOS 3.3 and the original Macintosh Filing System (MFS) have given way to the more hierarchical and categorized ProDOS and Hierarchical Filing System (HFS), respectively.

Organization of nonuniform data is one of the great unsolved questions of human endeavor.

(A parenthetical remark: In the Apple world, the word *hierarchical* seems rapidly to be giving way to the shorter and more easily pronounceable *hierarchial*—although the difference may grate on some ears, if enough people say it often enough, we'll have not only a new file system but also a new English word.)

With the hierarchical system, instead of having a single directory that lists all the files on a disk, the master directory can contain both files and subdirectories, with the subdirectories also including further divisions. Because of the branching structure, the result is sometimes called a "directory tree." This kind of tree has the roots at the top and leaves (files) and branches (subdirectories) sprouting at nodes that work down from there.

So now, instead of storing all your files as one big list, you can group them into subdirectories or folders that both we and the computer can treat as logical units (folders in the Macintosh's original MFS were just a screen convenience and didn't affect

ILLUSTRATION BY ROBERT KOPECKY

search operations). By setting a path in ProDOS or a folder in HFS, you can tell the system to take a more limited set of your files as the temporary frame of reference, thereby simplifying and speeding up many types of file operations.

Unfortunately, the availability of categories and hierarchies doesn't solve all the problems—you still have to figure out what files belong in which categories. By and large, as long as data files and their programs go into the same folder, the computer doesn't care, but these structural units may make a big difference to our ability to find and recognize our files.

Large quantities of files can bog down both operating systems and people.

When you try to make logical divisions, though, you quickly realize that classification and organization of nonuniform data is one of the great unsolved (and probably insoluble) questions of human endeavor. What seems to be the logical way to partition part of the data may not work for other elements, and what is strikingly plain one day may not seem so obvious when you're conducting a search later on.

Say, for example, you use your computer mostly for business correspondence. Presumably, you use it because you write scores or even hundreds of letters over the years. If you don't have perfect recall, how do you organize your past missives ?

You can, at the simplest, christen all your letter files by the name of the recipient of the letter and then put them into folders by date. Then, you'll have files labled *Josiah* or ones labeled *White* in folders with names such as *Jan85*, and so on.

One immediate problem is that all present operating systems require unique filenames, so if you wrote two letters to Ms. White in the same month, this system would quickly get you into trouble.

Using dates as filenames instead might have some advantages. Aside from the unresolved question of what happens if you have multiple letters on the same day, date order has the following advantages: It is consistent, it requires no individual judgments, and it is infinitely expandable. If you use year-first order (85-04-15), utilities that give you a directory list sorted by name will give your files in the correct date order as well (with ProDOS, though, you'll have to put at least one letter of the alphabet before each date).

Putting the mail by date inside folders labeled by recipient might work if you never wrote more than one letter per day, but if you had a large number of correspondents, that approach might also be a problem. Too many folders can choke the search-and-recognition process, just as large quantities of files can bog down both operating systems and people.

You can, instead, use topics as the folder names, with letters by recipient or by date inside the folder. Although deciding on topic labels is a judgment call rather than a clear-cut logical process, in most cases you should be able to arrive at a number of topics that is sufficiently detailed to be useful but still small enough to be manageable.

Topical organization also helps if

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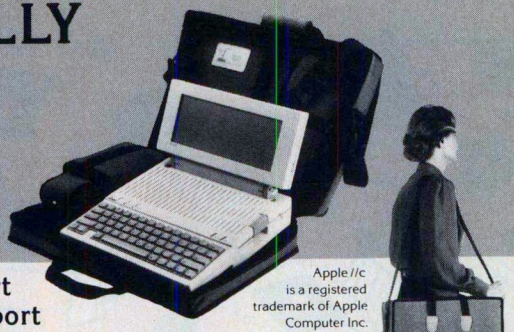

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you write a lot of the same types of letters. Using the Copy command or editing a file and then saving it under a new name (more dangerous, because you may forget to change names), you can easily start with an existing letter and customize it for the situation at hand.

I organize my own files by topic. Within the topics, for text files, databases, or other data files that have a time peg to remember them by, I use both names and dates.

On my hard disk, I use topics as the major subdivision (folders on the Mac or first-level subdirectory in ProDOS), and I keep my floppies organized in boxes by major topic and then in alphabetical order within the boxes. I try to keep the number of major topics down to an amount that will fit on a single screen display.

With the second-generation Apple operating systems, employing dates as filenames may at first seem wasteful, because the date is already recorded in both ProDOS and HFS. Either by using a utility program in ProDOS or by clicking on various choices in the View column of the Mac's main menu bar, you can see or arrange your files with the date information. On both systems, however, dates are usually accessible only on the main directory display. In the middle of an application program, if the system responds to your request for a file with a selection of the possibilities, what it shows you are the filenames—not the full directory entry with date information.

Similarly, if you look at a Macintosh desktop with small or large icons, what you get is the filename without a date. ProDOS shows you the date of last change on its main directory listing, but not the creation date. Also, if you make any kind of change on a file, both systems change the date automatically—whereas I want the date to stay fixed even if I go back later to add a note or correct an error.

That's why, for example, I've stored this column on my Mac in the *A+* Articles folder as TW-files.60608. That's Thoughtware and the topic, and then the date as year, month, and day (YMMDD) that I began this draft. When I see the name in a selection box or look at a directory list typed out for a disk envelope, I can tell both topic and date. I can even search for files by this embedded date, using utilities that let me search for partial

I try to keep the major topics down to an amount that will fit on one screen display.

matches on filenames (the one I use now on the Mac is HFS Locator from PBI).

On a ProDOS Apple II, I generally use the same procedure. Although ProDOS limits filenames to 15 characters, even with a 5-character date suffix, I still have 10 characters to indicate the purpose of the file.

I can't say that I never lose a file anymore, but I spend a lot less time opening up the wrong ones or searching through my directories for the right information. And when I get a dialog box or do a wild-card directory search, I can mix topic and embedded date to give me twice the chance of finding exactly what I'm looking for. With the number of files I've accumulated, I need all the help I can get. ✚

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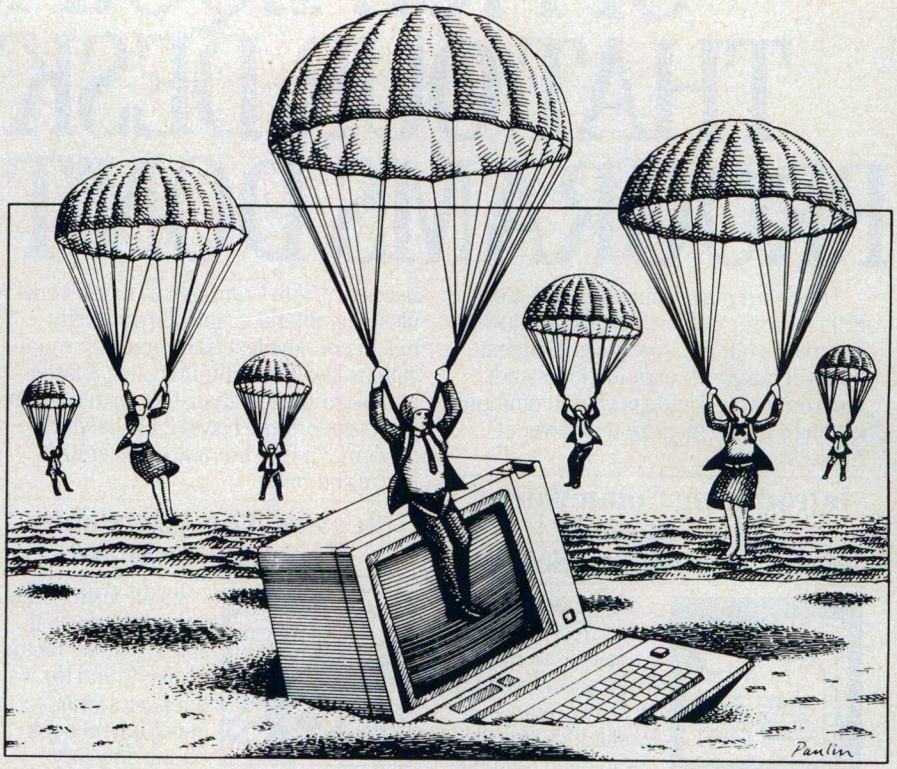
BY GARY B. LITTLE, CHRIS VAN BUREN, AND CRAIG CROSSMAN



DATA STORAGE WITH AN EXPANSION CARD

Q. *I've just purchased the new Apple II Memory Expansion Card. I want to use it for "raw" data storage; that is, I don't want to store my data as ProDOS RAM-disk files. How can I directly access the bytes on the memory card?*

A. The Memory Expansion Card is unique in that you do not use traditional bank-switching techniques to access the 256K to 1 megabyte of memory it might contain. Instead, you store a starting address in a read/write pointer and then begin reading or writing one byte at a time. Every time the computer reads a byte, the pointer is automatically incremented for you.

Programmers will recognize this technique as exactly the same one you use to read data from or write it to a disk file. The only difference is that you don't have to open or close the memory card as you would a file.

Three I/O registers hold the value for the memory-card pointer:

$C080+n0 (low byte)
$C081+n0 (middle byte)
$C082+n0 (high byte)

The *n* represents the slot number of the memory card.

Set up the pointer, using standard POKE commands from Applesoft or STA commands from assembly language.

Since the pointer is 24 bits long (3 bytes × 8 bits per byte), you can address any byte in a 16-megabyte range with this technique. Is this a subtle hint that future memory cards will have much greater capacity?

To read a byte of data, have the computer read a value from location $C083+n0. (For write operations, write to the same location.) As soon as you do this, the pointer increments, and the computer's ready to access the next byte on the card. That's how easy it is! —*GBL*

IIc UPGRADE FOR UNIDISK 3.5 USE

Q. *I recently went to my Apple dealer to inquire about purchasing a UniDisk 3.5. I was told that my December 1984 model Apple IIc would need an upgrade. The service department said the IIc motherboard had to be replaced and that there was a long waiting list. What does the upgrade really entail, and why do I need it to run the UniDisk 3.5? Will I lose any compatibility with my current hardware or software?*

A. To use *any* 3.5-inch disk drive, be it Apple's or a third party's, you must upgrade your IIc if it was purchased before December 1985. An authorized Apple dealer must do the upgrade your dealer was referring to, but it does not require the replacement of the IIc's motherboard.

Basically, the procedure involves replacing the old 16K monitor ROM with a new 32K monitor ROM, and two soldering modifications are required. You lose one feature: You can no longer boot from the external drive with a PR#7 command. You lose no compatibility and gain several new features, however. You can now boot from the UniDisk 3.5 by using a PR#5. Also, if no disk is in the internal drive, when you turn on the computer or type open-apple-Reset, the IIc will check the external drive before the Check disk drive message appears. Thus, if you have a ProDOS disk in the external drive, be it a 3.5- or 5¼-inch drive, your IIc will boot from it.

For you assembly-language programmers, a new mini-assembler is now included, with step, trace, and direct ASCII input. The upgrade also has a revised interrupt handler and a new protocol converter (a set of assembly-language routines). For more information, see *Apple II Programmer's Guide to the 3.5 ROM* (part number A2L4037) from Apple, and *Apple IIc Reference Manual* (part number 17727-7) or *ProDOS Technical Reference Manual* (part number 17728-5) from Addison-Wesley. —*CC*

APPLEWORKS AND ACCOUNTING

Q. *I own an Apple IIe, and my favorite program is AppleWorks. I have learned how to put many applications into the three AppleWorks features, but most have come from reading various man-*

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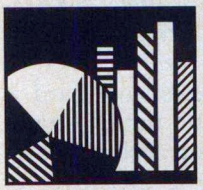

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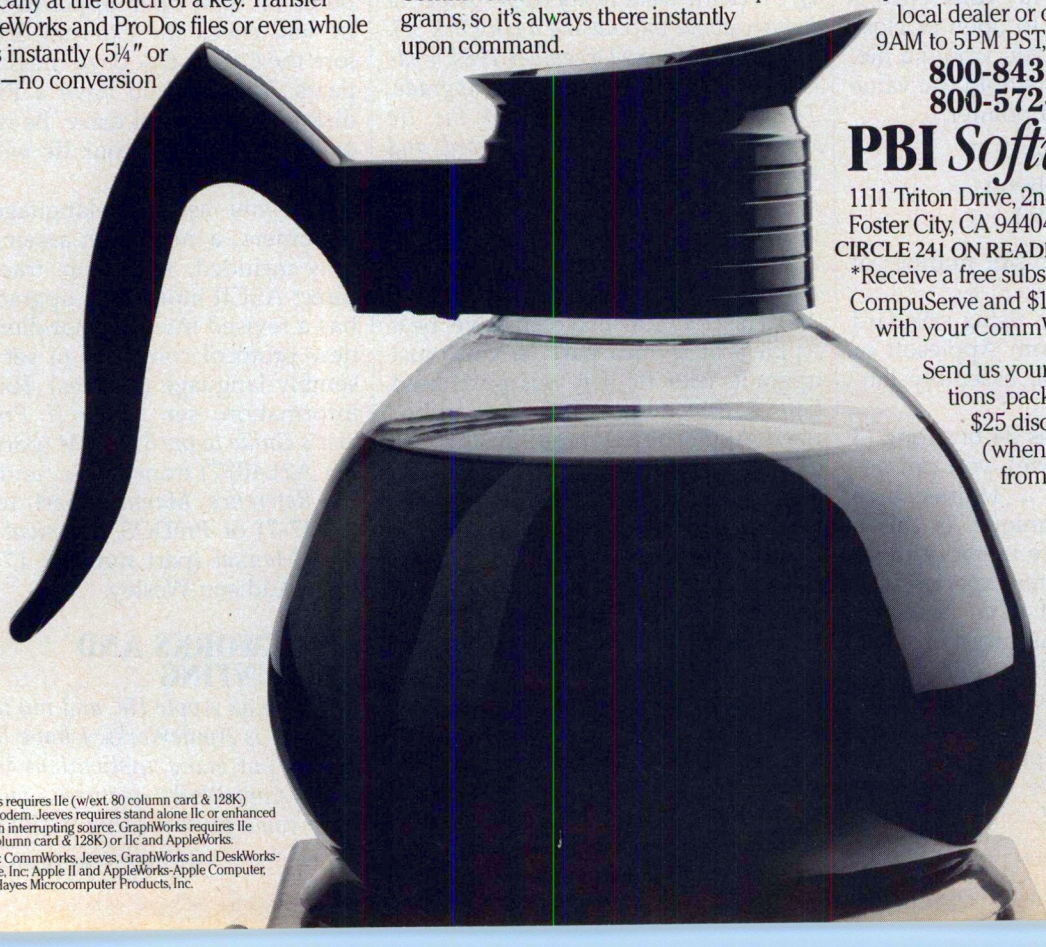

CommWorks requires IIe (w/ext. 80 column card & 128K) or IIc and modem. Jeeves requires stand alone IIc or enhanced 128K IIe with interrupting source. GraphWorks requires IIe (w/ext. 80 column card & 128K) or IIc and AppleWorks.

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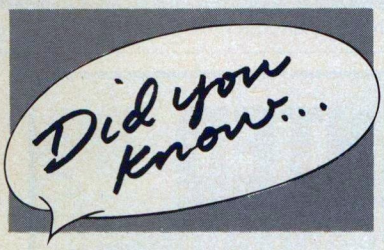

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uals I've obtained. Being an accountant, I'd like to put more accounting into the spreadsheet but don't know how to do it. Are there any books that have this kind of advanced application?

A. Information about advanced AppleWorks applications is becoming more and more plentiful. Often, a business can use AppleWorks and applicable add-on products to satisfy its accounting needs—and avoid purchasing a separate accounting package. A good place to begin is with these articles from past *A+* issues:

- "Business AppleWorks," Charles Rubin, July 1985
- "Personal AppleWorks," Charles Rubin, July 1985
- "Spreadsheet Accounting," Nancy K. Dirksen and W. M. Miller, Jr., September 1985

Another good source is the *AppleWorks Exclusive Reference* newsletter, published by the Q-mar group of San Diego, California. This publication often covers advanced applications and is dedicated to AppleWorks topics. Charles Rubin, author of *AppleWorks* (Microsoft Press), now has a more advanced AppleWorks reference, entitled *Command Performance: AppleWorks*.

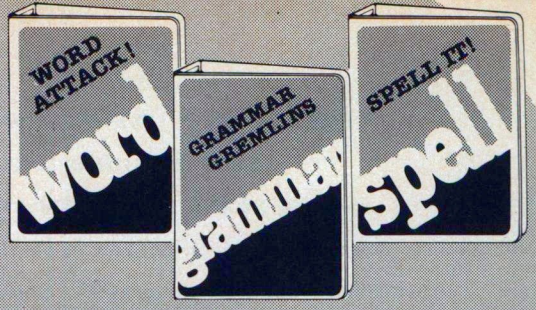
One way to get a head start on specific applications is to find existing templates that you can modify for your own needs. Many templates are in the public domain, and many others are available commercially. Two good sources of information for templates are The AppleWorks Users Group, 1300 Hinton Street, West Monroe, LA 71291 and The Q-mar Group, Box 11215, San Diego, CA 92111. —*CVB*

APPLEWORKS ON THE APPLE II PLUS

Q. *I am interested in being able to use AppleWorks and other IIe programs on my Apple II Plus. I am stationed outside of the U.S., and other Apple II owners who've recently come from the U.S. tell me it is now possible.*

A. You will need at least 64K RAM on your II Plus and an 80-column card. Optionally, you can get an extended RAM card and/or a shift key modification for uppercase/lowercase.

Several companies offer ways to run AppleWorks on a II Plus. Videx offers a program called AppleWorks Modify Plus, which works with AppleWorks Version 1.1–1.3 and any of several memory cards, for $59. The only 80-column card it works with is



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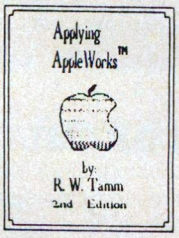

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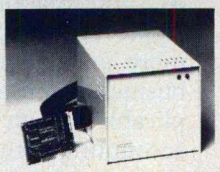

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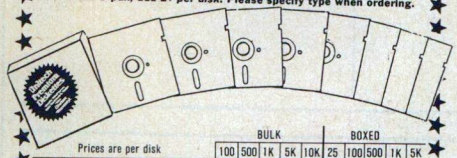

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the Videx 80-column card. You can contact the company at (503)-758-0521.

Davka Corporation ([800] 621-8227) offers ItWorks for $39.50. This program works with AppleWorks Version 1.1–1.3 and most memory and/or 80-column cards.

Norwich Data Services ([516]-922-9584) offers four versions of a program that works with AppleWorks Version 1.1–1.3: Plus-Works ($19.95) gives you a desktop with a maximum of 10K RAM, Plus-Works-XM ($49.95) works with most RAM and 80-column cards, Plus-Works-XMB ($49.95) is a special version for Basis 108 computers, and Plus-Works-L ($19.95) is a special version for Laser 3000 computers that gives you a 10K desktop.

Applied Engineering ([214]-241-6060) offers RamFactor, a memory card that goes into any slot from 1 to 7. You can add extra memory to expand it from 256K to one megabyte of RAM. It requires either a Videx or Viewmaster 80-column card. Although using this card is the most expensive route, it seems to be the most flexible and offers the most features. The card expands AppleWorks' desktop, increases the number of database records to 5100, increases the number of word-processing lines to 5100, and displays the time and date on the AppleWorks screen if your computer has any ProDOS clock. Additionally, AppleWorks performs faster if you move it into the card's memory. A battery backup option can save whatever is in the card's memory for up to 12 hours. —CC ✚

Gary B. Little has written four books on how to program the Apple II and also wrote the Point-to-Point communications program.

Chris Van Buren has written several books and manuals about microcomputing, including Lotus 1-2-3 and the IBM PC *from New American Library. He is currently editor and publisher of the* AppleWorks Exclusive Reference *newsletter.*

Craig Crossman is vice president of operations for an authorized Apple dealer in West Palm Beach, Florida. He is a contributing editor for other Apple publications and the Apple expert for The Source and Viewtron.

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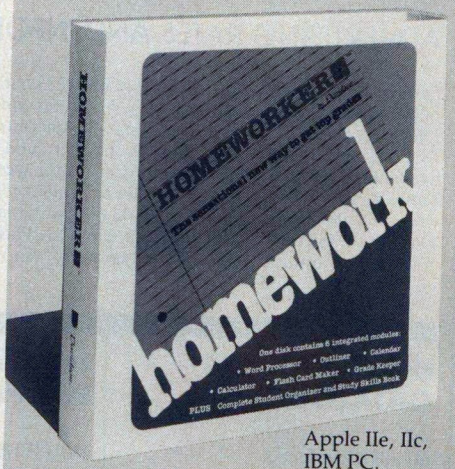

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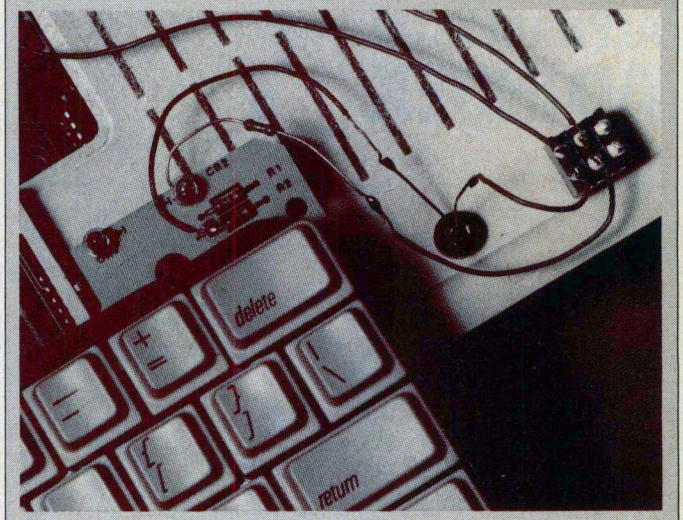

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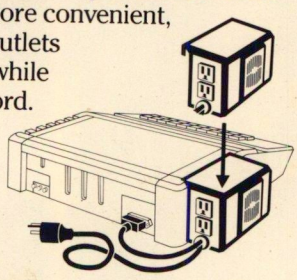

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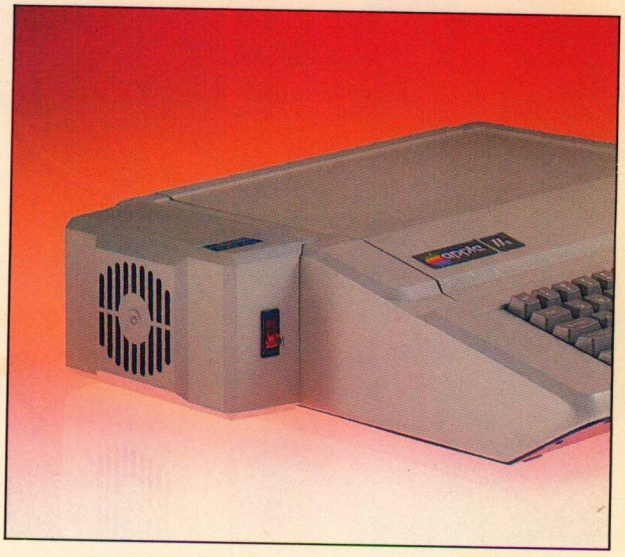

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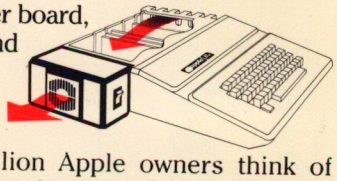

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